SLV-E5AE/AP/B/CP/EI/IT/VP
SLV-E6UV
RMT-AG1/V131A/V131C

SERVICE MANUAL

AEP Model
SLV-E5AE

Netherlands Model
SLV-E5AP

French Model
SLV-E5B

Spanish Model
SLV-E5CP

Irish Model
SLV-E5EI

Itarian Model
SLV-E5IT

Germany Model
SLV-E5VP

UK Model
SLV-E6UV

- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT II for MECHANICAL ADJUSTMENTS. (9-972-816-11)**

VHS
PAL NTSC

SPECIFICATIONS

System

Channel coverage

E5 : AE, AP, CP, VP :
PAL B/G:
VHF channels E2 to E12
CATV channels S01 to S03
S1 to S20
HYPER channels 2 to S41
UHF channels E21 to E69

E5 : B, NC, E6UV :
PAL (1):
UHF channels 21 to 69

E5EI :
VHF channels A-J
CATV channels S01-S03
CATV channels S1-S20
HYPER S21-S41
UHF channels E21-E69

E5IT :
VHF channels A-H2
CATV channels S01-S03
CATV channels S1-S20
HYPER S21-S41
UHF channels 21-61

RF output signal: UHF channels 30 to 39

Aerial out: 75 ohm asymmetrical aerial socket

Inputs and outputs

VIDEO IN: Phono jack (1)
Inputs signal: 1 Vp-p, 75 ohms, unbalanced, sync negative

AUDIO IN: Phono jack (1)
Input level: – 7.5 dBs
(0 dBs = 0.775 Vrms)
Input impedance: more than 47 kilohms

EURO-AV: 21 pin
Video input: pin 20
Audio input: pins 2 and 6
Video output: pin 19
Audio output: pins 1 and 3

AUDIO OUT: Phono jack (1)
Rated output level: – 7.5 dBs at load
Impedance: 47 kilohms
Output impedance: less than 10 kilohms

– Continued on next page –

MICROFILM

VIDEO CASSETTE RECORDER
SONY®

General

Power requiremens	**E5 : AE, AP, B, CP, EI, IT, VP :** 220 – 240V AC, 50Hz **E6UV :** 240 V AC, 50 Hz
Power consumption	25 W
Operating temperature range	5℃ to 40℃ (41 °F to 104 °F)
Storage temperature range	– 20℃ to 60℃ (– 4 °F to 140 °F)
Dimensions	430 × 90 × 372 mm (w/h/d) (17 × 3⅝ × 14¾ inches) including projecting parts and controls
Weight	5.2 kg (11 lb 7 oz)

Accessories supplied

Remote Commander (1)
R6 (size AA) batteries
(SLV-E6UV : 4)
Aerial lead (1)
Audio cable (1)
AC mains lead (1)
RF screwdrier (1)
Video Plus + Remote Commander
(SLV-E6UV only) (1)
Quick Start Manual (1)

Note

Design and specifications are subject to change without notice.

This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONTENTS

SERVICE NOTE

1. RETURNING PINCH ROLLER, GUIDE ROLLER AND ELEVATOR CAM TO STOP CONDITION

1) Remove the bottom panel.
2) Turn the worm gear Ⓐ of the cam motor, located at lower of the MD, to the arrow direction Ⓑ by finger.

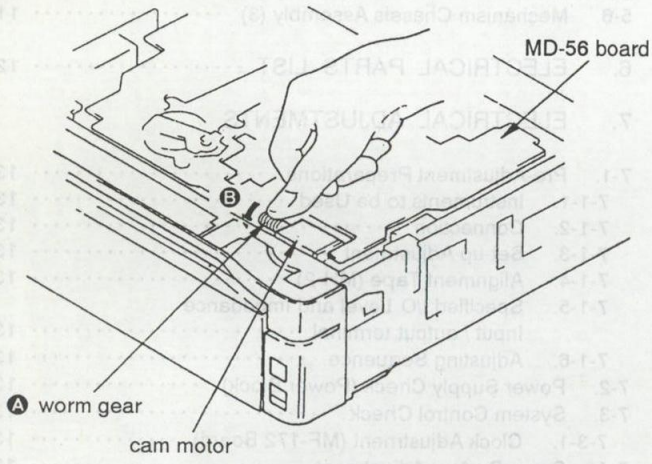


Fig. 1

2. WINDING TAPE TO CASSETTE HALF

Turn the fly wheel Ⓐ of the capstan motor to the arrow direction Ⓑ by finger, then the cassette tape will be wound to the cassette half.

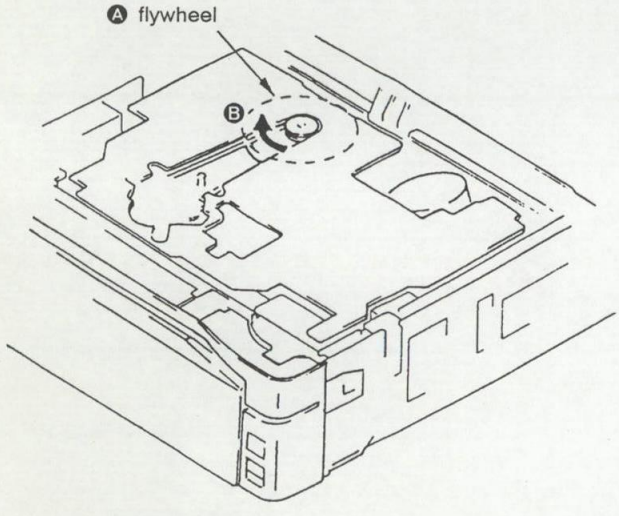


Fig. 2

3. TAKING OUT CASSETTE WHEN UNIT IS DEFECTIVE WITH CASSETTE IN

1) Remove the upper case.
2) Turn the worm gear Ⓐ of the FL cassette compartment motor to the arrow the direction Ⓑ by finger.

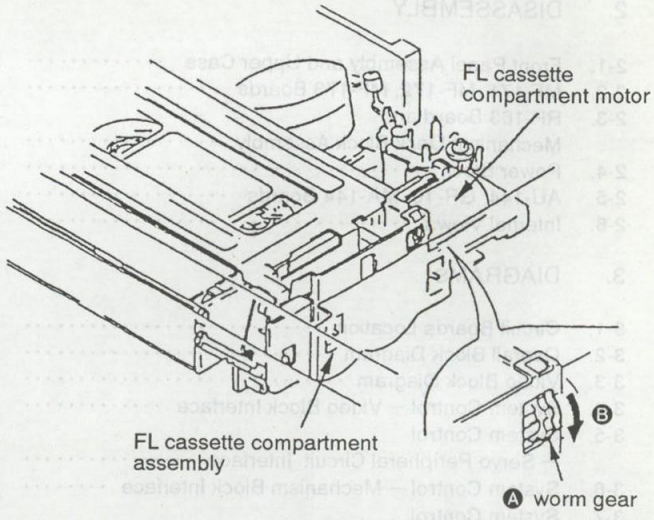


Fig. 3

Note: When performing 1. to 3., be careful not to clog and damage the cassette tape.

4. UPPER DRUM REPLACEMENT

4-1. Removal of Upper Drum

1) Remove the screw ❶ (+P3 × 6) and take out the grounding shaft ❷. (See Fig. 4.)
2) Remove the two screws ❸ (+BVTP 3 × 10) and take out the RP-163 board ❹. (See Fig. 4.)
3) Completely remove the rotary upper drum board and desolder the soldering indicated by the arrows (12 points).
4) Remove two screws ❺ (PSW3 × 8) and take out the rotary upper drum in the arrow direction Ⓐ. (See Fig. 5.)
   If it is difficult, remove by shaking the rotary upper drum gradually.

Note: If the drum can not be removed, check whether the solders have been removed or not again.

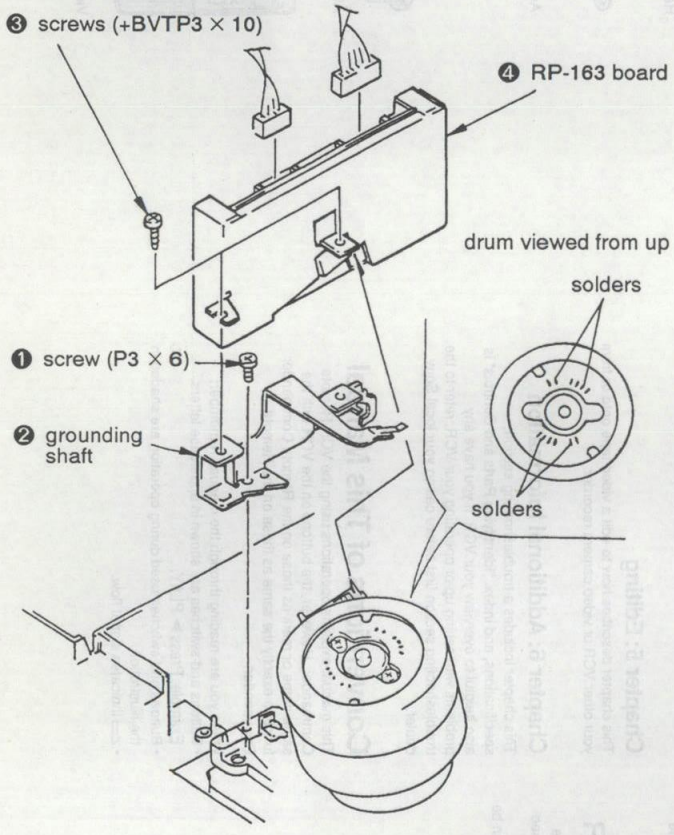


Fig. 4

4-2. Mounting Upper Drum

1) When inserting the rotary drum into the lower drum, be careful not to blur the contacting surface with fingerprint or the like.
2) Mount the rotary upper drum board by aligning marked ➡ with marked ⇒ of rotary transformer board (lower drum) so that the screw holes of both upper and lower drums match. (See Fig. 5.)
3) If it is difficult, mount the upper drum by shaking it gradually.
   Note: Be careful not to damage the head. Make sure that the upper drum is tightly inserted.
4) Tighten two screws ❺ (PSW3 × 8). (See Fig. 5.)
   Note: Temporary tighten two screws. After making sure that upper drum is tightly inserted, tighten the screws.
5) Solder 12 points on the board of the rotary upper drum.
6) Fix the grounding shaft ❷ using the screw ❶ (+P3 × 6) so that the protrusion of grounding shaft end contacts the center of the drum shaft.
   Note: When attaching the grounding shaft ❷, be careful not to apply force to the spring section of it.

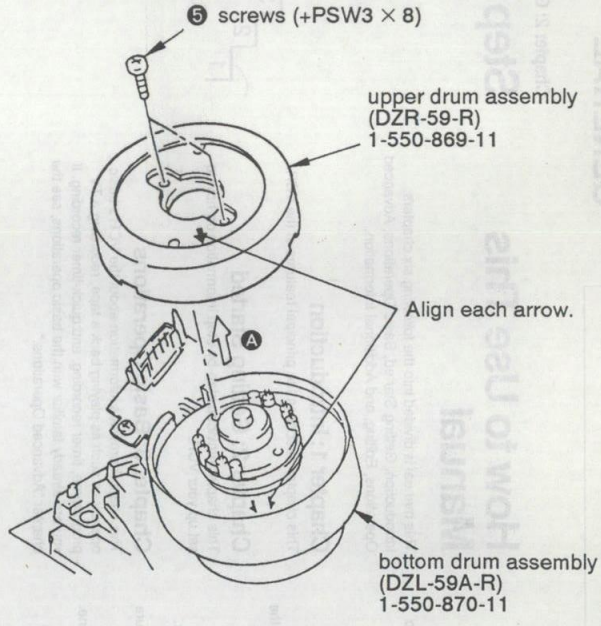


Fig. 5

This section is extracted from SLV-E6UV instruction manual.

SECTION 1
GENERAL

Chapter 1: Introduction

Features

Here are some of the features you'll enjoy with your video cassette recorder:

- High Quality (HQ*) picture technology that gives sharp, finely detailed pictures.
- Replay feature that, at a push of a button, replays in slow motion the last two seconds of a recorded scene.
- A long-range Remote Commander that lets you control the VCR functions.
- Easy-to-use on-screen menus for choosing many VCR options.
- An on-screen display that indicates elapsed time and remaining tape length for use in recording and playback.
- A timer to record up to eight TV programmes.
- Auto-tracking adjustment that automatically adjusts picture distortion.
- DUAL MODE SHUTTLE ring on the VCR and Remote Commander let you have quick access to a desired scene.
- OPC (Optimum Picture Control) function allows you to improve recording and playback quality by adjusting the system parameter automatically to the condition of the video heads and video tape.

* HQ
Video Cassette Recorders (VCR) with this marking incorporate VHS high-quality picture technology and are compatible with any video cassette recorder bearing the VHS mark.

Colour Systems of Your VCR

- This VCR is designed to record and playback using the PAL (I) colour system. Recording of video sources based on other colour systems cannot be guaranteed.
- Video tapes recorded with the NTSC colour system can be played back on this VCR.

How to Use This Manual

This manual is divided into the following six chapters: Introduction, Getting Started, Basic Operations, Advanced Operations, Editing, and Additional Information.

Chapter 1: Introduction
This chapter describes the principal features of the VCR.

Chapter 2: Getting Started
This chapter provides step-by-step information on how to set up your VCR.

Chapter 3: Basic Operations
This chapter provides information about the VCR's basic operations such as playing back a tape, recording a TV programme, timer recording, and quick-timer recording. If you are already familiar with the basic operations, see the chapter "Advanced Operations."

Chapter 4: Advanced Operations
This chapter describes various kinds of functions you can take advantage of when operating the VCR. Read this chapter after you become familiar with your VCR.

Chapter 5: Editing
This chapter describes how to edit a video tape onto or from your other VCR or video camera recorder.

Chapter 6: Additional Information
This chapter includes a troubleshooting section, specifications, and index. "Identifying Parts and Controls" is also helpful to overview your VCR. If you have any problems with setting up or operating your VCR, refer to the troubleshooting section first before calling your local Sony dealer.

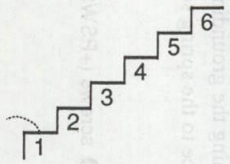
Conventions of This Manual

This manual explains operations using the VCR Remote Commander. However, the buttons on the VCR with the same name or mark as those on the Remote Commander function exactly the same as those on the Remote Commander.

When you are reading through the manual, remember:
- Buttons and switches are shown in uppercase letters. Example: Press ► PLAY.
- Buttons and switches used during operation are shaded in the illustration.
- ⇦ indicates signal flow.

Chapter 2: Getting Started

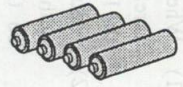
Step 1 Unpacking the VCR



Take the unit out of the box and unpack the accessories. Check that you have the following items.
- Remote Commander (1)
- R6 (size AA) batteries (4)
- Aerial lead (1)
- AC mains lead (1)
- RF screwdriver (1)
- Video Plus+ Remote Commander (1)
- Quick Start Manual (1)

If you do not have all of these items, please contact your dealer.


Remote Commander

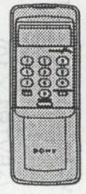

R6 (size AA) batteries


Aerial lead

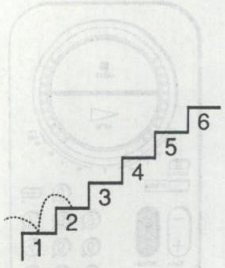

RF Screwdriver

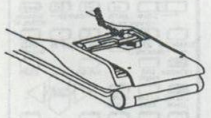

AC mains lead

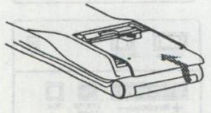

Quick Start Manual

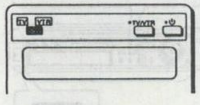

Video Plus+ Remote Commander

Step 2 Preparing the Remote Commander









Inserting Batteries

1 Slide open and remove the cover.

2 Insert two R6 (size AA) batteries so that the + and – polarities match the polarity diagrams inside the battery compartment.

3 Replace and close the cover.

Operating the VCR with the Remote Commander

Set the TV/VTR remote control selector at the top of the Remote Commander to "VTR."

If you are using a Sony TV

You can use the Remote Commander of this VCR to operate the TV. When doing this, slide the TV/VTR remote control selector to "TV." Buttons on the Remote Commander with a dot (•) on or beside them can be used to operate your TV. To operate the VCR, return the TV/VTR remote control selector to "VTR."

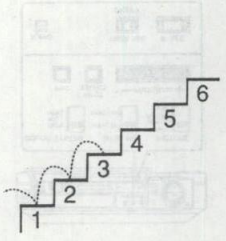
How to Use the Remote Commander

When you operate the VCR using the Remote Commander, point it at the remote sensor located on the VCR. For the location of the remote sensor, see "Identifying the Parts and Controls" on page 35.

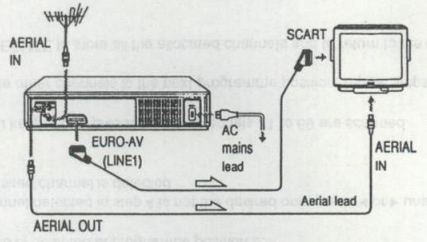
Notes:

- Under normal operation, batteries last for approximately three months. However, if the Remote Commander will not be used for a long period, remove the batteries from the compartment to avoid possible damage from battery leakage.
- Do not use a new battery together with an old one.
- Do not use different types of batteries.

Step 3 Connecting the VCR



Whenever you view video tapes as well as TV programmes on your TV screen, make sure the connections to your VCR and TV are correct. The connection between the VCR and TV varies depending on the type of TV receiver and aerial you have. First check the type of TV you have, and follow the appropriate instructions in this section.



1 Turn the VCR around so that you can see the rear panel.

2 Disconnect the aerial input lead from your TV and connect it to the socket marked AERIAL IN on the rear of the VCR.

3 Connect the aerial lead (supplied with the VCR) to the socket marked AERIAL OUT on the VCR and then plug it into the aerial input socket on your TV.

4 Check all connections to ensure they are firm.

5 Take the AC mains lead and plug it into the socket on the back of the VCR marked AC IN, then plug the other end into the wall socket.

Additional Connections

The connection using the supplied aerial lead is the basic connection for viewing and recording TV programmes. If your TV has a SCART connector, make additional connections for video viewing. Additional connections can improve picture quality.

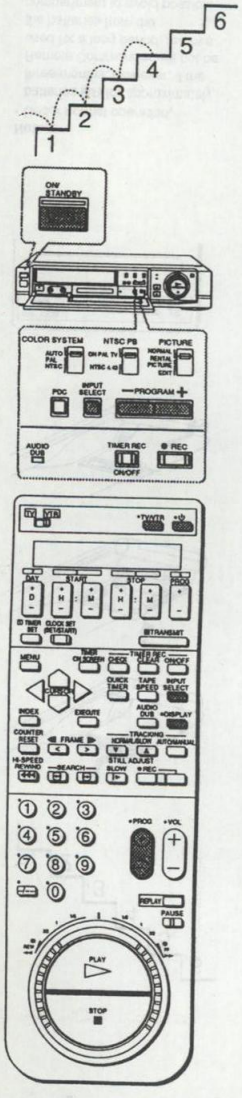
If your TV is equipped with a 21-pin SCART connector

You can obtain a higher quality picture by connecting the EURO-AV of the VCR to the SCART connector of the TV. For this you need a VMC-2121HG cable (not supplied).

When using a SCART connector make sure to set the RF MODULATOR on the SET UP MENU to "OFF." (See page 28).

If you have connected the VCR to your TV using only the aerial sockets, you have to adjust one of the television programme positions to receive the VCR's playback signals.

Step 4 Tuning the TV to Your VCR



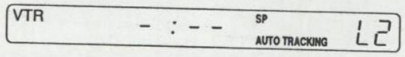
If you have connected the VCR to your TV using the EURO-AV cable, you can skip this step.

1 Turn on the TV.

2 Press ⏻ (ON/STANDBY) on the Remote Commander or ON/STANDBY on the front of the VCR so that the green light above the button lights up.

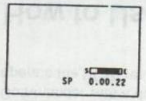
3 PressTV/VTR button to light VTR in the display window.

4 Press INPUT SELECT to light L2 (line 2) in the display window.
To use all of the buttons on the Remote Commander, open the cover.

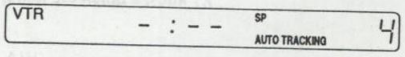


5 On your TV select programme position preset on UHF channel 34. If channel 34 is already used to receive TV-Broadcast, see "If the picture shows interference" on page 11.

6 Press DISPLAY on the Remote Commander (See page 16) and tune the TV so that a blue screen with the Display (tape speed and tape counter) appears clearly on the TV screen.



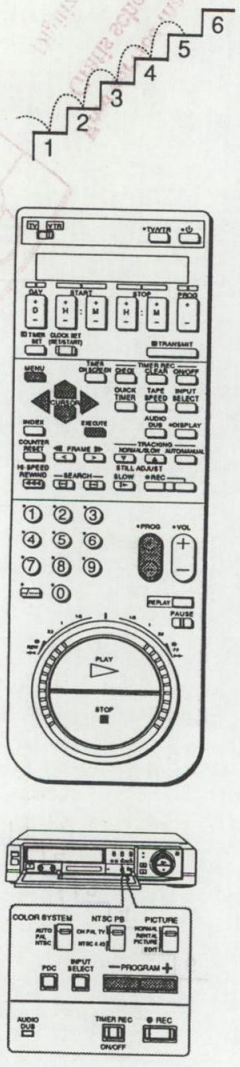
7 Press INPUT SELECT to light up the programme number in the display window.



8 Press PROG +/– (PROGRAM +/–) to check to see if the TV screen changes to a different programme.

You have now tuned your TV to the VCR. When you play back a video cassette, set the TV to the programme position selected in step 5.

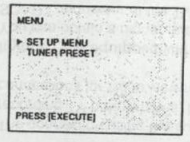
Step 5 Tuning Your VCR to Television Broadcasts



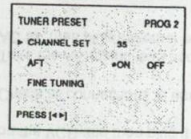
To watch and record TV programmes on your VCR, you must preset the active channels. You can preset the preferred channels using the Remote Commander and the TUNER PRESET display.

Presetting Desired Channels

1 Press MENU.
The main MENU appears on the TV screen.



2 Press ▲ or ▼ to move the cursor (▶) to TUNER PRESET, then press EXECUTE.
The TUNER PRESET menu appears on the TV screen.



3 Press PROG +/– (PROGRAM +/–) to select the desired programme position.

4 Press ◀ or ▶ to scan the channels.
When the first channel received in your area is detected, the channel number stops changing and the picture for that channel appears for approximately 5 seconds, after which the blue screen appears. The above illustration shows the display when channel 35 is detected at programme position 2.

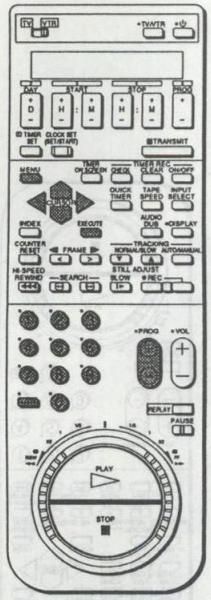
5 If the channel detected in step 4 is not the desired one, press ◀ or ▶ until the picture for the desired channel is detected.

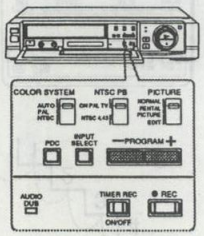
Note
When you keep ◀ or ▶ pressed, UHF channels 21 to 69 are scanned.

6 To allocate other channels to the next programme position, repeat steps 3 to 5.

7 Press EXECUTE to store all the allocated channels and to return to the original TV screen.

(Continued)





Allocating the Channels Directly

Enter the desired programme numbers using the programme number buttons. To enter single digits, press the desired number. To enter a two digit number such as 24, press the –/-- (10s digit) button, then press 2 and 4.

Disabling Unwanted Channels

If you want only the desired programme positions to appear when you select the programme position for normal recording, timer recording or quick-timer recording, you can do this by following the procedure below.

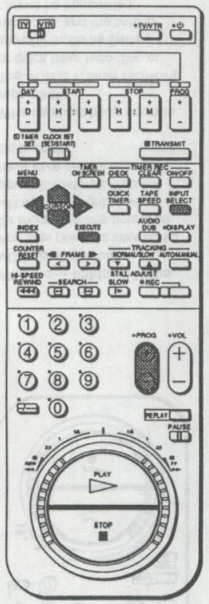
1 Press MENU, then press ▲ or ▼ to move the cursor (▶) to TUNER PRESET, then press EXECUTE.

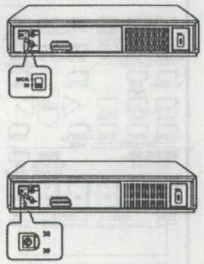
2 Press PROG+/– (PROGRAM +/–) until the programme position you want to disable appears in the PROG field of the TUNER PRESET menu.

3 Press the programme position number button "0" twice or keep pressing the cursor keys ◀ or ▶ until "0" is displayed in the CHANNEL SET field.

4 Repeat steps 2 and 3 to disable other programme positions.

5 Press EXECUTE.





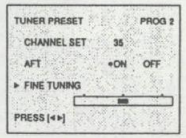
Fine Tuning

This VCR has been designed to tune in channels automatically. This function is called "Auto Fine Tuning" (AFT).
If the AFT does not produce a clear picture, you can also use the manual tuning function.

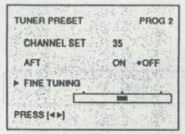
1 Press PROG +/– (PROGRAM +/–) to select the programme position for which you can't get a clear picture.

2 Call up the TUNER PRESET menu.
(See "Presetting Desired Channels" on page 9.)

3 Press ▲ or ▼ to move the cursor (▶) to FINE TUNING.
The FINE TUNING meter appears.



4 Press ◀ or ▶ until you obtain the best possible picture.
Note that the dot (•) beside the "ON" of the AFT position automatically moves to "OFF."



To improve the TV signal

The LOCAL/DX switch on the rear of the VCR is provided to strengthen or attenuate the reception signals. Normally set this switch to the DX position. If the reception signals are very strong, set it to the LOCAL position.

If the picture shows interference

1 Select a programme position on the TV between UHF channels 30 and 39, where the TV displays no picture and a rustling sound or no sound at all is heard.

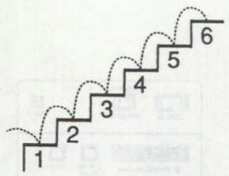
2 Press INPUT SELECT to light L2 (line 2) in the display window.

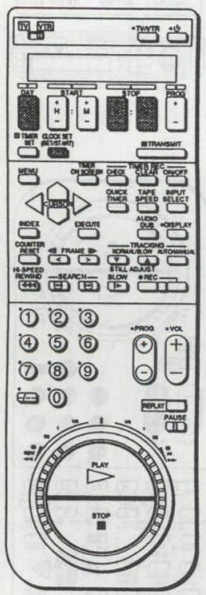
3 Turn the RF CHANNEL screw at the rear of the VCR with the supplied RF screwdriver, to a position where the TV clearly displays a blue screen with the Display (tape speed and tape counter indicators).

4 Press INPUT SELECT to light up the programme number in the display window.

5 Press PROG +/– (PROGRAM +/–) to check to see if the TV screen changes to a different programme.

Step 6 Setting the Clock

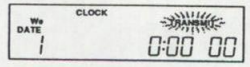




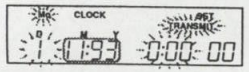
The last thing you need to do in getting started is to set the VCR clock on the Remote Commander.

Example: To set to 15:30, 27th November, 1993

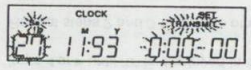
1 Press CLOCK SET.



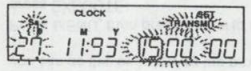
2 Press the D (DAY) button until 11 M (Month) 93 Y (Year) appears.
When the day display goes beyond 31, the month advances.



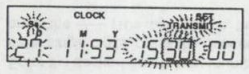
3 Press the + or – side on the D (DAY) button until 27 appears.
The day of the week is set automatically.

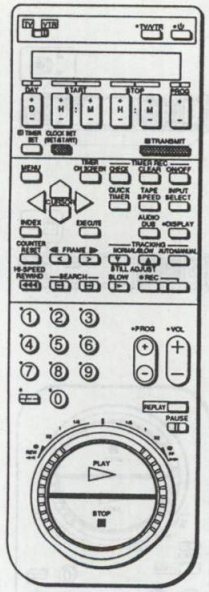


4 Press the H (Hour) button in the STOP section to set the hour to 15.



5 Press the M (Minute) button in the STOP section to set the minutes to 30.



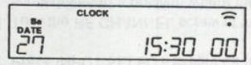


When –:–– lights up in the VCR display window
Any time power is interrupted for more than one hour, you will see –:–– lighted when power is restored. You will have to re-set the date and clock again.

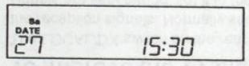
When a short beep sounds repeatedly
The VCR is in timer recording or quick timer recording or standby mode for timer recording, and the setting cannot be transmitted.

To correct the preset date and time
Open the Remote Commander cover and repeat steps 1 to 7.

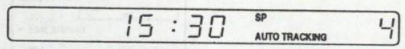
6 Point the Remote Commander at the VCR and press TRANSMIT.
When time and date are transmitted successfully, a beep sounds.



7 Check the display window of the VCR to see if the display shows the current time, and press CLOCK SET.

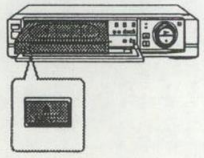


(On the Remote Commander)



(On the VCR)

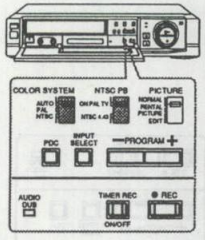
Playback



Inserting a Video Cassette

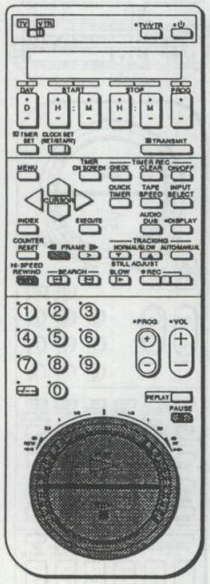
1 Open the drop down panel.

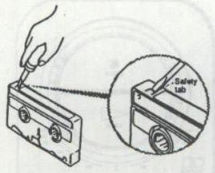
2 Gently press the centre of the front side of the cassette with the arrow indication facing upwards until the mechanism draws it into the compartment.
When the cassette has been loaded, the cassette indicator lights in the display window, the VCR turns on, and the time and date clock switches to the tape counter automatically.



Ejecting a Video Cassette

Press ≙ EJECT on the VCR.
The cassette indicator light in the display window goes out. When the cassette is ejected the tape counter switches to the time and date clock automatically.
You can eject the cassette even when the power is off, so long as the AC power cord is plugged into the wall outlet.

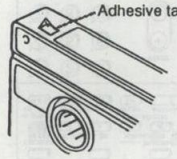




Protecting your cassette against accidental erasure

Cassettes have a safety tab to protect against accidental recording.
Break off the safety tab with a screwdriver or other tool.
If the safety tab is removed, the cassette is ejected when you try to record on it.

To record on a cassette with the safety tab broken off
Simply cover the tab hole with adhesive tape.



Playing Back a Cassette

This VCR automatically detects the tape speed (SP or LP for PAL system video tapes and SP or EP for NTSC system video tapes) with which a video cassette was recorded. If you insert a cassette with its safety tab removed, playback starts automatically.

Note: The OPC function operates automatically during playback if the OPC button/ indicator is on and lit. For details, see page 31.

1 Insert a cassette.
The VCR turns on automatically.

2 Turn on the TV.
If you have made only an aerial connection, switch the TV to the programme position you set the VCR to in "Step 4 Tuning the TV to your VCR" on page 8.

3 Set the COLOR SYSTEM switch on the VCR to conform to the colour system of the cassette to be played back. Normally this switch should be set to AUTO. If streaks appear when playing back a video tape, select the colour system format that matches the format the video tape was recorded with to obtain a better picture. After you are finished, return the COLOR SYSTEM switch to the AUTO position.

Colour system	Switch position
PAL	PAL
NTSC	NTSC

4 If you are playing back an NTSC-recorded tape, set the NTSC PB switch to conform to the TV system you are using. See page 17.

5 Press ► PLAY.
When the tape reaches the end, the VCR automatically rewinds the tape to the beginning (auto rewind).

To stop playback
Press ■ STOP.

To stop playback for a moment
Press II PAUSE.
Press II PAUSE again or press ► PLAY to resume playback.

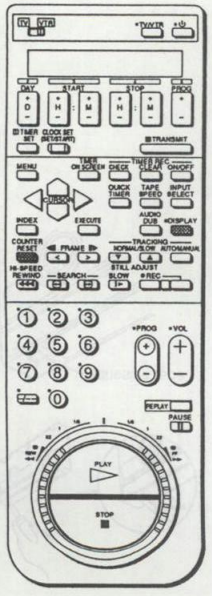
To fast forward the tape
Press ■ STOP, then turn the DUAL MODE SHUTTLE ring clockwise to FF ►►

To rewind the tape
Press ■ STOP, then turn the DUAL MODE SHUTTLE ring counterclockwise to ◄◄ REW.
These operations will continue even if you release the ring.

To rewind the tape at a higher speed
Press ◄◄◄ HI-SPEED REWIND.

To automatically start playback after rewinding or high-speed rewinding the tape
Using the VCR only, press ► PLAY while pressing ◄◄◄ HI-SPEED REWIND or using the DUAL MODE SHUTTLE ring.

If you want to view the tape in reverse mode
Press ◄II FRAME (reverse) during playback.

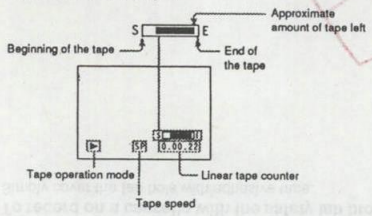


Using the Display

The Display is useful for immediately determining tape speed, tape operation mode, amount of tape remaining, and tape count. To use the Display, press DISPLAY on the Remote Commander. The Display does not appear when an NTSC recorded tape is being played back.

The Display with tape counter

When you press the DISPLAY button, the amount of the tape remaining and the linear tape count are displayed.



Note: Tape operation mode, and tape speed are displayed when you make change to them.

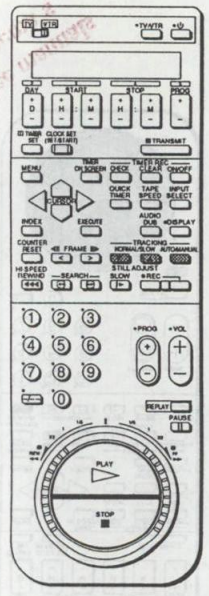
To turn off the Display

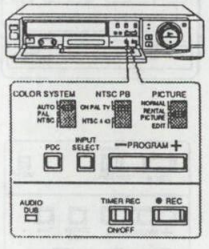
Press DISPLAY.

Note: Tape operation mode, and tape speed are displayed even when the DISPLAY is turned off.

Resetting the Tape Counter

The tape counter in the display window helps you to locate a certain scene after playback. Press COUNTER RESET on the Remote Commander to set the counter to the "0H00M00S" (counter zero position before playing back the tape). The tape counter is automatically reset to zero whenever a cassette is inserted. The VCR keeps counting the length of the tape being played back. Note, however, that the tape counter does not count the positions without video signals recorded.

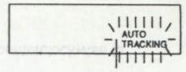




Enhancing Picture Quality

Automatic Tracking Adjustment

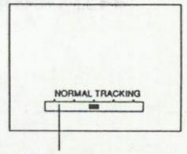
The AUTO TRACKING indicator in the display window flashes while the VCR is searching for the best tracking condition and lights steadily when the best possible playback picture is obtained.
If the VCR cannot find the best tracking condition, adjust the tracking manually.



Flashes.

Manual Tracking Adjustment

Press ▼/▲ on the TRACKING NORMAL/SLOW (STILL/ADJUST) buttons to get the best picture. The tracking meter appears on the screen. The distortion should disappear as you press one of the two buttons. If you cannot get a clear picture by adjusting the tracking manually, press the AUTO/MANUAL button to return to automatic tracking.



Tracking meter

Reducing Streaks and/or Snow

Select RENTAL PICTURE on the PICTURE switch on the VCR.

Auto Head Cleaner

The auto head cleaner built into the VCR automatically cleans the video heads when a cassette is loaded or unloaded. If the effect of head cleaning is not sufficient even after a cassette has been loaded/unloaded several times, clean the heads using the Sony V-25CL video head cleaning cassette. For details on head cleaning, see page 41.

NTSC-recorded Tapes

You can play back a cassette recorded in either the NTSC 4.43 or NTSC 3.58 video system on a PAL system television set.

Set the NTSC PB switch according to the type of TV you have.

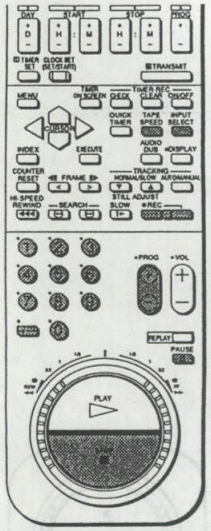
PAL system TV ➡ set the NTSC PB switch to ON PAL TV.
NTSC 4.43 system ➡ set the NTSC PB switch to NTSC 4.43.

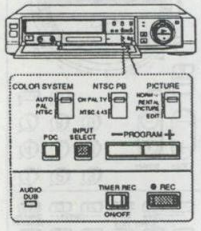
Set the COLOR SYSTEM switch to AUTO, or if the picture is unclear, to NTSC.

The following will occur during playback of an NTSC-recorded tape

- The display will not appear even if you press DISPLAY.
- Depending on the TV you are using, the following may occur separately or in combination:
  - the picture becomes black and white
  - the picture shakes
  - no picture appears on the screen
  - black streaks appear horizontally on the screen
  - the colour density increases or decreases
  - noise occurs in the EP mode.
- If a tape has portions recorded in both the PAL and NTSC video systems, the tape counter reading will not be correct. This discrepancy is due to the difference between the counting cycles of the two video systems.

Recording TV Programmes





If the tape is ejected when the REC button is pressed
The tab on the cassette is out. Use another cassette with its safety tab in place.

If you are using a Sony TV
You can use the Remote Commander of this VCR to operate the TV.
When doing this, slide the TV/VTR remote control selector at the top of the Remote Commander to "TV." To operate the VCR, return the TV/VTR remote control selector to "VTR."

You can record TV programmes in one of three ways:
- While watching the programme (this page)
- While not watching the TV at all (page 19)
- While watching another programme (page 19)

Before recording, check to see that all connections have been made correctly.

Note: The OPC function operates automatically during recording if the OPC button/ indicator is on and lit. For details, see page 31.

Recording while Watching the TV Programme

1 Turn on the TV.
If you have made the VCR/TV connection via the aerial socket, select the programme position for the VCR on the TV.

2 Insert a cassette with a safety tab into the compartment.
The VCR turns on automatically.

3 Press INPUT SELECT to light up the programme number in the display window.

4 Press TAPE SPEED to select the recording tape speed.
The selected tape speed lights up in the display window.

5 Press PROG +/– (PROGRAM +/–) to select the desired programme position.
You can also use the numbered buttons on the Remote Commander. For 2 digit numbers first press –/– – and then the 2 numbers.

6 Press the two ● REC buttons on the Remote Commander at the same time.
When you control from the VCR, press ● REC only. The REC indicator lights up and recording begins. The Display appears on the TV screen. The Display is not recorded on the tape.
When the tape reaches the end, the VCR rewinds the tape automatically to the beginning.

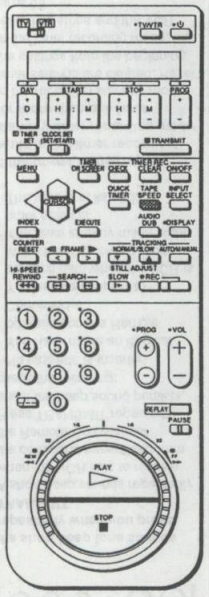
To stop recording
Press ■ STOP.

To pause recording
You can stop recording an unwanted scene and resume recording smoothly.

1 Press II PAUSE when an unwanted scene appears.
Recording stops and the VCR enters the recording pause mode.

2 Press II PAUSE again at the desired point to release the pause mode.
Recording resumes form the point set in step 1.

When the recording pause mode lasts for approximately 5 minutes, the VCR enters the stop mode.



Recording with the TV Off

Turn off the power of the TV or monitor.
There is no interference with the recording.

Recording while Watching Another Programme

Select the programme position you want to watch on the TV.

Note: If the VTR indicator in the display window is lit, press TV/VTR.

If you use a colour monitor
You cannot watch another programme during recording unless the monitor has an internal TV tuner.

Maximum Recording Time of a Cassette

Recording in either the SP or LP modes for the PAL system and playback in the SP or EP modes for the NTSC system is possible with this VCR. When recording, select the desired tape speed (SP, LP or EP) using the TAPE SPEED button. During playback, the VCR automatically detects the recording format, and then plays back the cassette in the appropriate mode.
A tape recorded in the EP mode runs three times as slowly, and a tape recorded in the LP mode runs twice as slowly, as a tape recorded in the SP mode. Refer to the charts below for the recording/playback time available in each mode.

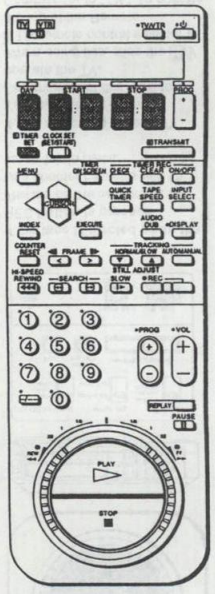
PAL colour system

Cassette Tape	Recording/Playback time	
	SP mode	LP mode
E-240	4 hrs.	8 hrs.
E-180	3 hrs.	6 hrs.
E-120	2 hrs.	4 hrs.
E-60	1 hr.	2 hrs.

NTSC colour system

Cassette Tape	Playback time	
	SP mode	EP mode
T-160	2 hrs. 40 min.	8 hrs.
T-120	2 hrs.	6 hrs.
T-60	1 hr.	3 hrs.
T-30	30 min.	1 hr. 30 min.

Timer Recording



The Timer Recording function allows you to preset your VCR to record up to eight programmes within a one-month period.

Before you begin

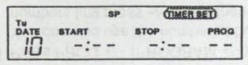
- Check to make sure that the time and date clock is set correctly. (See "Setting the Clock" on page 12.)
- Check to see that the video cassette is long enough to record all the programmes.
- Check to make sure that the safety tab of the video cassette has not been removed. If you insert a cassette without a safety tab and try to set the timer, a short beep sound is heard repeatedly and the cassette is automatically ejected from the VCR.

Setting the Timer

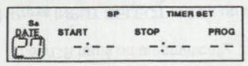
Example

Here's how to record a programme broadcast on channel 26 from 20:00 to 21:55 on Saturday, 27th November 1993.

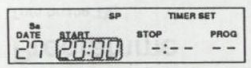
1 Press TIMER SET.



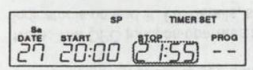
2 Press the + or – side on the D (DAY) button until 27 appears.
The day of the week is set automatically.

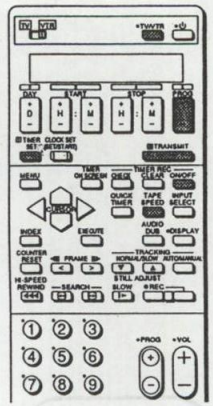


3 Press the H (Hour) button and then the M (Minute) button in the START section to set the recording start time.



4 Press the H (Hour) button and then the M (Minute) button in the STOP section to set the recording end time.



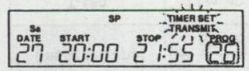


If a short beep tone sounds repeatedly when you press TRANSMIT
A short beep sounds repeatedly when the VCR fails to receive the command transmitted from the Remote Commander.
Press TRANSMIT repeatedly, and if the beep sound persists, check the following:

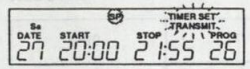
- No cassette is inserted.
- You have made an illogical operation on the Remote Commander.
- You have attempted to transmit data when the VCR is in the timer recording mode.
- You have already made eight timer settings.
- The tape is at its end.

If the power is interrupted while in the timer recording standby/timer recording mode for more than one hour
In the recording standby mode, timer settings are cleared. Reset the settings from the beginning.
In the timer recording mode, the recording stops and the VCR turns off.
If the power interruption lasts for less than one hour, the VCR returns to the original mode when the power is supplied again.

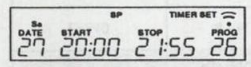
5 Press PROG +/– to select the desired programme position for recording.



6 Press the TAPE SPEED button to select the desired tape speed for recording.

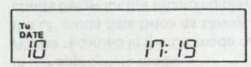


7 Point the Commander at the VCR and press TRANSMIT.
When a beep tone sounds, the VCR is ready for timer recording.



8 To set other programmes repeat steps 2 to 7.

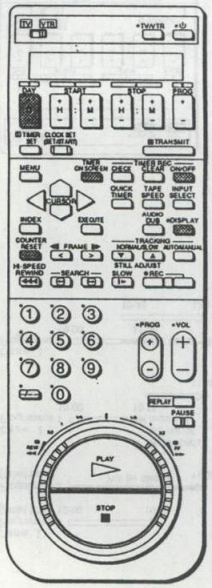
9 Press TIMER SET.
The current time appears on the LCD display.



The VCR turns on automatically and starts recording at the preset start time, and goes off at the preset stop time.

To use the VCR before timer recording starts

Press TIMER REC ON/OFF, then turn on the power of the VCR, and press TV/VTR button. After using the VCR, remember to press TIMER REC ON/OFF again.



Daily/Weekly Recording

You can preset your VCR for daily or weekly recording. Daily recording records the same programme every day of the week while weekly recording records the same programme on the same day, every week.

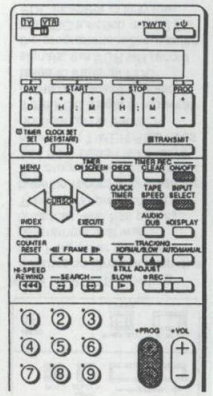
Press the - (minus) side of the D (DAY) button repeatedly until the desired indicator appears in step 2 of "Setting the Timer" on page 20.
The indication in the LCD display changes as shown on the left.

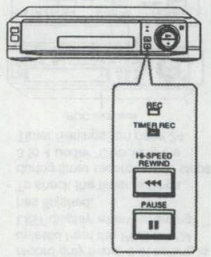
To stop timer recording

Press TIMER REC (ON/OFF).

You can use the following buttons during timer recording

TIMER REC (ON/OFF)	To stop timer recording
COUNTER RESET	To reset the counter to "0H00M00S"
DISPLAY	To display data screen information
TIMER ON SCREEN	To check the timer settings





Notes:

- For buttons you can use during quick-timer recording, see "You can use the following buttons during timer recording" on page 22.
- If a power interruption occurs during quick-timer recording, recording stops and your VCR shuts off. If power is restored within one hour, and it is before the recording end time, recording starts again from that point. If the interruption lasts for more than one hour, any presettings are erased and you must reset the time and date for your programmes. Note that the tape counter returns to "0H00M00S," after a power interruption.

Quick-Timer Recording

This function allows you to preset your VCR to record for a specified amount of time from now without having to set the recording start time. You can set the recording duration in increments of 30 minutes, for up to nine hours. Note, however, that it provides only an approximate setting for the programme you wish to record.
If you have not set the time and date clock correctly, quick-timer recording cannot be done.

1 Insert a cassette with a safety tab in place.

2 Press INPUT SELECT to light up the programme position number indicator in the display window.

3 Press TAPE SPEED to select the tape speed, SP or LP for the PAL system.

4 Press QUICK TIMER on the Remote Commander.
If a cassette with the safety tab removed has been inserted, the VCR ejects the cassette.

5 Press PROG +/– (PROGRAM +/–) to select the programme for recording while the programme number is flashing in the display window.

6 Press QUICK TIMER within 30 seconds after selecting the programme to start recording.
The TIMER REC indicator lights up on the VCR.

If you don't press QUICK TIMER within 30 seconds after selecting the programme position, the VCR quits the quick-timer mode.

7 Press QUICK TIMER to determine the recording duration. Each press on the button increases the recording duration in increments of 30 minutes as shown below.

→ 0:00 → 0:30 → 1:00 → ····· → 8:30 → 9:00 →

Turn off the TV, and the VCR continues recording.
The recording duration decreases minute by minute until 0:00 appears, then the VCR turns off automatically.

To stop quick-timer recording

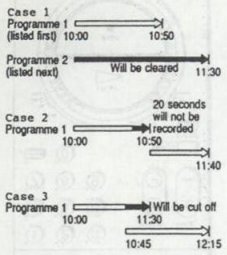
Press TIMER REC (ON/OFF).

To extend the recording duration during recording

Press QUICK TIMER the desired number of times. One press on the button increases the duration by 30 minutes.

If the VCR is in the standby mode for recording

Press TIMER REC (ON/OFF) to turn off the TIMER REC indicator on the VCR and do steps 3 to 7.



Overlapping Timer Recordings

If you have made a "mistake" when presetting multiple programmes, the VCR will interpret your settings as described in the following cases.

Case 1

If you preset two programmes to record at the same time...

The programme listed first on the PROGRAM LIST display has priority over the other programmes. The timer settings for lower priority programmes are erased from the PROGRAM LIST display when recording begins for the first programme.

Case 2

If you preset programme 2 to start recording at the same time you preset programme 1 to finish recording...

The last 20 seconds of programme 1 is not recorded because the VCR enters the recording pause mode for programme 2 before programme 1 is finished.

Case 3

If you set programme 2 to start recording before programme 1 is finished recording...

Programme 2 starts recording before programme 1 has finished.

Checking the Timer Settings

You can display your timer settings to confirm the programmes you wish to record.

1 Press TIMER REC (ON/OFF).
The TIMER REC indicator on the VCR turns off.

2 Press ⏻.

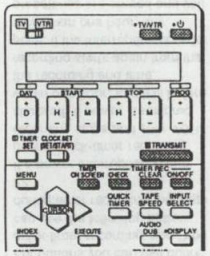
3 Press TV/VTR.

4 Press TIMER ON SCREEN.
The PROGRAM LIST appears.

PROGRAM LIST		24.11		WED
DATE		START	STOP	PROG
27.11	SAT	20:00	21:55	26 SP
13.12	MON	8:30	10:15	50 LP
MON – SAT		21:00	0:00	L2 LP
EVERY SUN		9:55	12:30	12 SP

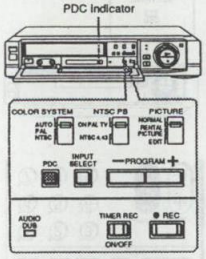
5 Press TIMER ON SCREEN to return to the original screen.

6 Press TIMER REC (ON/OFF).
The VCR returns to the timer recording standby mode.



Notes:

- If you preset a programme to record only once, that setting is deleted from the PROGRAM LIST display when recording has finished.
- To check the timer settings during timer recording, do steps 3 to 4 under "Checking the Timer Settings" on page 24.



Notes on PDC Recording

- If recording times overlap due to a PDC timer shift, the programme that was broadcast first has priority. The second programme will begin to record only when the first programme has finished.
- The PDC button is effective only when TIMER REC does not light up on the VCR.
- If the PDC singal is too weak or the broadcasting station failed to transmit PDC signals, the VCR will record the programme without using the PDC function even if the PDC indicator is lit in the display window.
- Make sure that you enter the times exactly as indicated in the TV programme guides; otherwise the recording will not be made.
- To use the PDC function properly, set the timer separately for each programme.

Changing or Cancelling the Timer Settings

You can change or cancel the timer settings by referring to the PROGRAM LIST display.

1 Press TIMER REC (ON/OFF).
The TIMER REC indicator on the VCR turns off.

2 Press ⏻.

3 Press TV/VTR.

4 Press TIMER REC CHECK to display the PROGRAM LIST.

5 Press TIMER REC CHECK to move the cursor (▶) to the programme you wish to change or cancel.

PROGRAM LIST		24.11		WED
DATE		START	STOP	PROG
▶ 27.11	SAT	7:00	8:00	6 SP
13.12	MON	8:30	10:15	50 LP
MON – SAT		21:00	0:00	L2 LP
EVERY SUN		9:55	12:30	12 SP

6 **To change the setting**
Re-enter all the items and transmit the new settings to the VCR.
(See "Setting the Timer" steps 1 to 7 on pages 20 and 21.)
The VCR is automatically ready for the timer recording, or enters the timer recording standby mode.

To cancel the setting
Press TIMER REC CLEAR. To return to the original screen, press TIMER ON SCREEN. If there are other timer settings on the list, press TIMER REC ON/OFF to return to the timer recording standby mode.

PDC Recording

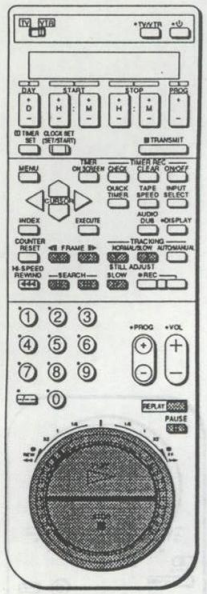
The broadcasting system transmits PDC (Programme Delivery Control) signals with its TV programmes. These signals assure you that your timer recording are made regardless of broadcast delays, early starts, or broadcast interruptions. For example, if an urgent news bulletin interrupts a regular programme, recording will stop. As soon as the interrupted programme resumes, recording starts again.

1 Make sure the TIMER REC indicator is not lit on the VCR.

2 Before setting the timer to record, press PDC on the VCR so that the PDC indicator lights in the VCR display window.

3 Set the timer following the steps under "Timer Recording" (page 20).
The VCR will enter standby mode for PDC recording before the turn-on timer so as to be ready if there is a change in the start time. The PDC indicator in the display window lights up when you press the PDC button on the VCR.

Variable Speed Playback



To reduce the bands on the top or bottom of the screen while in pause mode
Change to the slow motion play mode and adjust the picture with TRACKING NORMAL/SLOW (STILL ADJUST) ▼/▲.

To reduce the picture shaking while in pause mode
Adjust the picture with TRACKING NORMAL/SLOW (STILL ADJUST) ▼/▲.

The following section explains the advanced playback functions available on your VCR. No sound is heard during these operations.

Variable Speed Playback Using the DUAL MODE SHUTTLE Ring

You can enjoy variable speed playback using the DUAL MODE SHUTTLE ring on either the VCR or the Remote Commander.
In any playback mode, turn the DUAL MODE SHUTTLE ring in either the forward or reverse direction. When you release the ring, normal playback resumes.

Pausing the Picture

During playback, press II PAUSE. To resume normal playback, press either ► PLAY or II PAUSE. If you leave your VCR in pause mode, normal playback resumes after approximately 5 minutes.

Picture Search

During playback, turn the DUAL MODE SHUTTLE ring to ◄◄ REW (rewind) or FF ►► (fast forward).
A high-speed picture appears on the TV screen.
To resume normal playback, release the DUAL MODE SHUTTLE ring at the desired scene.

Locked Picture Search

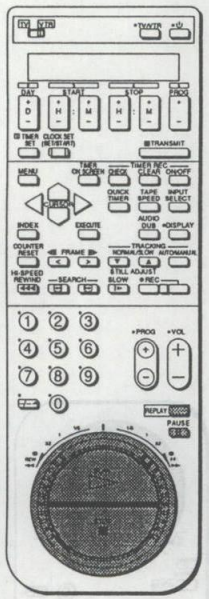
This feature allows you to lock in and view a high-speed picture while playing or pausing a tape.
During playback or while in the pause mode, press ⊖ SEARCH (forward) or ⊖ SEARCH (reverse). You can also use the II► FRAME (forward) and ◄II FRAME (reverse) buttons to change direction after either the ⊖ SEARCH or ⊖ SEARCH buttons have been pressed.
To resume normal playback, press ► PLAY.

Slow-motion Playback

During playback or while in the pause mode, press I► SLOW (1/5 of normal speed). You can also use the ◄II FRAME (reverse) and FRAME II► (forward) buttons to change direction during slow-motion playback. To view a tape in slow motion in forward mode using the DUAL MODE SHUTTLE ring, turn the DUAL MODE SHUTTLE ring clockwise (for forward viewing) to 1/5, and for reverse counterclockwise (for reverse viewing) to 1/5.

Frame-by-frame Picture

While in the pause mode, press ◄II FRAME to reverse the picture one frame. Press FRAME II► to advance the picture one frame.
To resume normal playback, press either ► PLAY or II PAUSE.



Note:
Noise may occur and the colour may normally not be reproduced during variable speed playback when you play tapes recorded in LP speed depending on the TV connected to the VCR.

Replay Picture

While in the playback or pause modes, press REPLAY once on the Remote Commander. For two seconds, as displayed on the counter, the previous scene is played back in reverse mode at -X1 speed. It is then played back in forward mode at X1/5 speed (slow motion). Press REPLAY and hold it down to return to a desired scene. Release the REPLAY button to play back the scene at X1/5 speed (slow motion).
To resume normal playback or enter the pause mode, press either ► PLAY or II PAUSE.

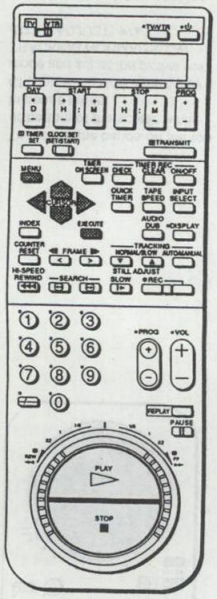
X2 Normal Speed Playback

Using this function you can view the contents of your tape at two times the normal speed in either the reverse or forward modes. To view a tape at two times the normal speed in forward mode turn the DUAL MODE SHUTTLE ring clockwise to X2, and for reverse mode conterclockwise to X2. When you release the ring, normal playback resumes.

Viewing the Picture During Fast-forward or Rewind

During fast-forward, turn the DUAL MODE SHUTTLE ring clockwise to FF ►►.
During rewind, turn the DUAL MODE SHUTTLE ring counterclockwise to ◄◄ REW.
To return to the fast-forward or rewind mode, release the ring.

Customizing Your VCR – SET UP MENU

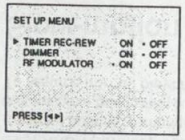


You can customize your VCR using the SET UP MENU.

1 Press MENU.
The main MENU appears.

2 Press ▲ or ▼ to move the cursor (▶) to SET UP MENU.

3 Press EXECUTE.
The SET UP MENU appears.



4 Press ▲ or ▼ to move the cursor (▶) to the menu choice you want, then press ◀ or ▶ to move the dot (•).
See below for menu choices.

5 Press EXECUTE to store the setting.

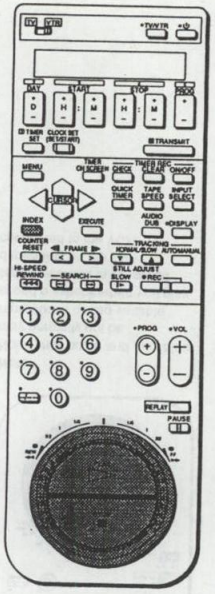
Menu choices

• TIMER REC-REW
Select "ON" to automatically rewind the tape after all timer settings have been recorded, or select "OFF" to cancel this setting. If the tape has reached the end it is automatically rewound regardless of the timer settings made.

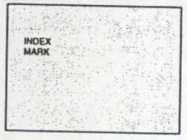
• DIMMER
Select "ON" to make the display window dimmer, or select "OFF" to make the display window brighter.

• RF MODULATOR
Select "ON" if you have made the VCR/TV connection via the aerial socket only.
Select "OFF" if you have made the VCR/TV connection via the EURO-AV connector.
If you have made the VCR/TV connection via the aerial socket only, and if you select RF MODULATOR to "OFF" then picture disappears. To get back the picture repeat from step 1.

Index Function



You can find specific scenes easily using the markings (index points) recorded on a cassette. This function is called the index function.
The VCR automatically inserts index signals each time you use the recording, timer recording or quick-timer recording functions (index mark). The index works as a divider between scenes, and is not numbers. So, when you specify the index mark later, you have to specify the relative position from the current position (the first index, the second index... from the current position). When going from the recording pause mode to the recording mode, an index mark is not inserted.

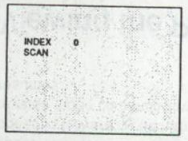


Playing Back from the Index Point – INDEX SCAN

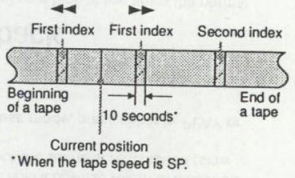
Here's how to find and play back a programme you've marked with an index signal.

1 Insert an indexed cassette into your VCR.

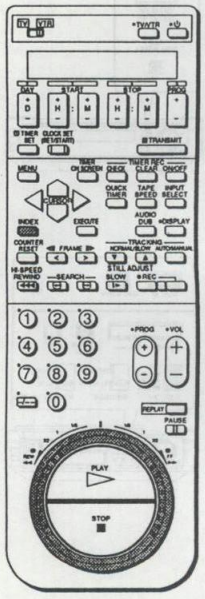
2 Press INDEX once.
The INDEX SCAN indicator appears on the TV screen.



3 Turn the DUAL MODE SHUTTLE ring clockwise to FF ▶▶ (forward) to locate the following programme, or counterclockwise to ◀◀ REW (reverse) to locate the previous programme.
The VCR goes to the next or previous index signal. The VCR plays the tape for approximately 10 seconds and then moves to the next index in the selected direction. The index number changes one by one.



4 Press ▶ PLAY when you locate the desired index signal.



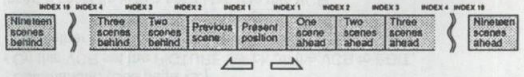
Locating an Index Mark – INDEX SEARCH

You can find an index point where you want to start playback, by entering a specific number.
For example: INDEX 8 is the number of the index signal marked on the scene you want to view.

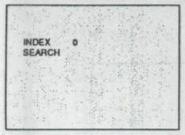
1 Insert a cassette with index signals marked on it.

2 Press INDEX repeatedly until the index mark number from which you want to start playback appears on the TV screen.

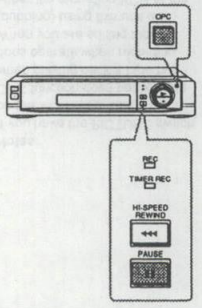
You can search for up to 19 index marks behind or ahead of the present position.

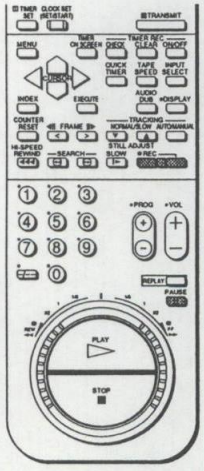


3 Turn the DUAL MODE SHUTTLE ring clockwise to FF ►► (forward) to locate the following programme or counterclockwise to ◄◄ REW (reverse) to locate the previous programme.
The VCR starts searching and the index number is counted down to zero.
Playback starts from the desired point.



OPC (Optimum Picture Control)





This function allows you to improve recording and playback quality by adjusting the system parameter automatically to the condition of the video heads and video tape. To maintain better picture quality, it is advisable to leave the function on so that the OPC button/indicator remains lit.

Using the OPC Function when Recording

Before you start recording, press the OPC button/indicator on the VCR so that it lights up. Press ● REC.
The OPC light flashes rapidly while the tape is being measured. The complete measurement is retained until the cassette is ejected. If you use that same tape again without ejecting it, the tape is not measured again.

When you are in the recording pause mode and the OPC button/indicator flashes slowly
The OPC function does not work if you press II PAUSE to release the pause mode. To use the OPC function, press ● REC. After measurement is completed, the VCR returns to the recording pause mode. Press II PAUSE to start recording.

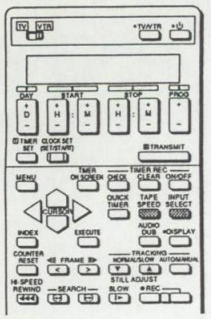
When you are using timer recording
When you want to use the OPC function during timer recording pause mode, press the OPC button/indicator on so that it lights up.

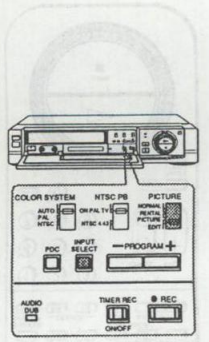
Using the OPC Function when Playing Back a Tape

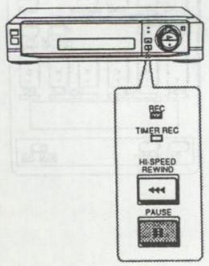
When the OPC button/indicator is on, the OPC function works on all types of tapes, including rental tapes. You can play back a tape using the OPC function even if the tape was not recorded with it.

Notes:
- Tapes recorded using the OPC function are played back normally on VCRs that do not have the OPC function.
- If you have the PICTURE switch on the VCR set to EDIT, the OPC function does not operate when playing back a tape but does operate when recording. When you are editing tapes (dubbing) using this unit as either the recording VCR or the playback VCR, use the EDIT setting.

Tape Dubbing



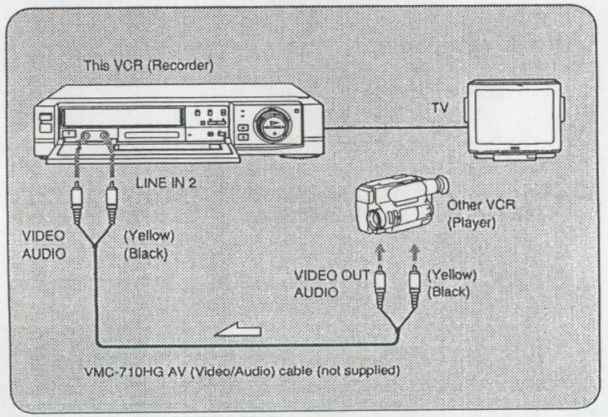




Using an additional VCR, you can record programmes from one VCR to another.

Editing from Another VCR

Here's how to edit from another VCR (such as an 8 mm video camera recorder for playback) when using this VCR for recording.



Before you begin

- On this VCR select L2 (LINE IN 2) with INPUT SELECT.
- On this VCR select SP or LP using the TAPE SPEED button on the Remote Commander. (See page 19.)
- On this VCR set the PICTURE switch on the VCR to EDIT. If the other VCR has a similar switch, set it to EDIT as well.

1 Insert a cassette with a safety tab into this VCR.

2 Turn on the power of the playback VCR and insert a source cassette without a safety tab.

3 Find the playback start point and set the other VCR (playback VCR) to playback pause.

4 Find the recording start point and set this VCR (recording VCR) to recording pause.

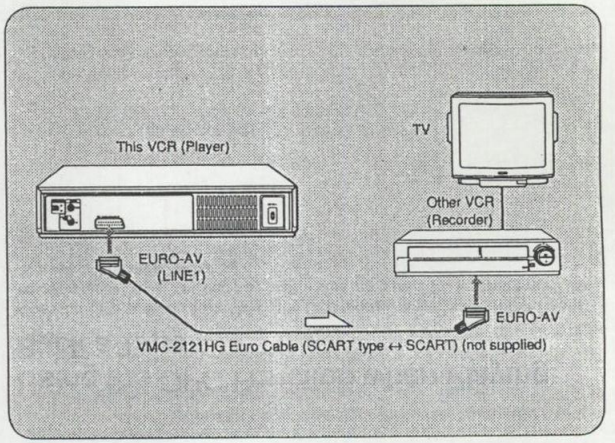
5 Press II PAUSE on both VCRs.
For best results, press II PAUSE on the playback VCR just before pressing II PAUSE on the recording VCR.
When you have finished editing, press ■ STOP on both VCRs.

Note :
You can connect another VCR to the EURO-AV connector. In this case select LINE 1 with INPUT SELECT.

Notes:
If you have the PICTURE switch on the VCR set to EDIT, the OPC function does not operate when playing back a tape but does operate when recording. When you are editing tapes (dubbing) using this unit as either the recording VCR or the playback VCR, use the EDIT setting.
Refer to the other VCR's instruction manual for the operation.

Editing onto Another VCR

Here's how to edit onto another VCR when using this VCR for playback.



Before you begin
On this VCR set the PICTURE switch on the VCR to EDIT.
If the other VCR has a similar switch, set it to EDIT as well.

1 Insert a cassette without a safety tab into this VCR.

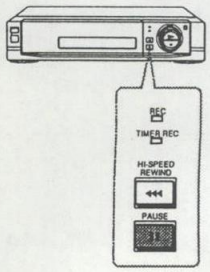
2 Turn on the power of the recording VCR and insert a cassette with a safety tab in place.

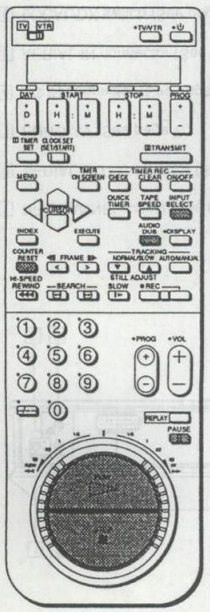
3 Find the playback start point and set this VCR (playback VCR) to playback pause.

4 Find the recording start point and set the other VCR (recording VCR) to recording pause.

5 Press II PAUSE on both VCRs.
For best results, press II PAUSE on the playback VCR just before pressing II PAUSE on the recording VCR.
When you have finished editing, press ■ STOP on both VCRs.

Identifying the Parts and Controls



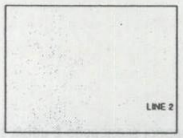


Audio Dubbing

This section shows you how to dub-over new sound onto the pre-recorded normal track. This way you can replace unnecessary sound with some other sound.

1 Insert a pre-recorded cassette into the VCR, and prepare a stereo system or other audio source.

2 When you use other audio source, press INPUT SELECT until the LINE 2 indication appears on the TV screen.



3 Find the audio dubbing end point and press COUNTER RESET.
The counter shows "0H00M00S."

4 Find the audio dubbing start point and press II PAUSE to set the VCR to playback pause mode.
The DUAL MODE SHUTTLE ring is useful for this operation.

5 Press AUDIO DUB.
The AUDIO DUB indicator lights up on the VCR.

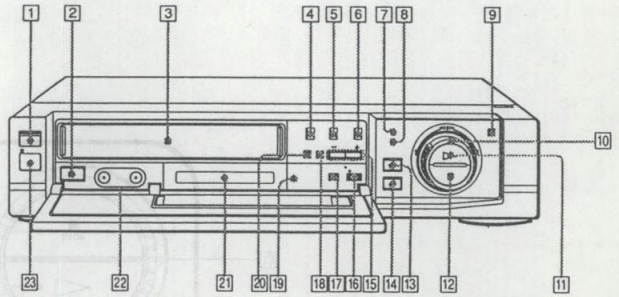
6 Press II PAUSE to release the pause, and at the same time start the stereo system or other audio source. When the tape reaches the end point (0H00M00S) sound insertion stops automatically.

To pause audio dubbing
Press II PAUSE.

To stop audio dubbing
Press ■ STOP.

Note :
You can also dub-over new sound from another VCR by choosing LINE 1 with INPUT SELECT.

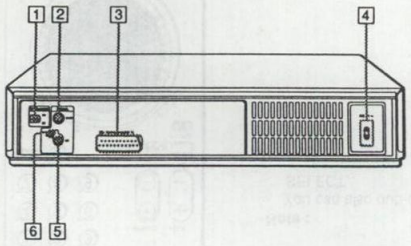
Front Panel



1 ON/STANDBY switch and indicator (See page 8.)
2 ▲ EJECT button (See page 14.)
3 Cassette compartment (See page 14.)
4 COLOR SYSTEM switch (See page 15.)
5 NTSC PB switch (See page 17.)
6 PICTURE switch (See page 17.)
7 REC indicator (See page 18.)
8 TIMER REC indicator (See page 23.)
9 OPC button/indicator (See page 31.)
10 DUAL MODE SHUTTLE ring (See pages 15 and 26.)
11 ► PLAY button (See page 15.)
12 ■ STOP button (See page 15.)
13 ◄◄◄ HI-SPEED REWIND button (See page 15.)
14 II PAUSE button (See pages 15 and 26.)
15 PROGRAM +/– buttons (See page 8.)
16 ● REC button (See page 18.)
17 TIMER REC ON/OFF button (See page 21.)
18 INPUT SELECT button (See page 8.)
19 AUDIO DUB indicator (See page 34.)
20 PDC button (See page 25.)
21 Display window (See page 8.)
22 LINE IN 2 VIDEO/AUDIO jacks (See page 32.)
23 Remote sensor (See page 6.)

(Continued)

Rear Panel



1 RF CHANNEL screw (See page 11.)

2 AERIAL OUT Connector (See page 7.)

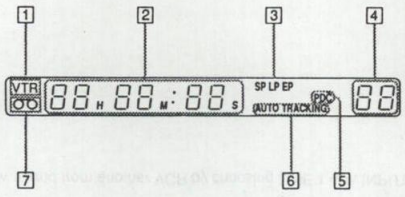
3 EURO-AV (See page 7.)

4 AC IN connector (See page 7.)

5 AERIAL IN connector (See page 7.)

6 LOCAL/DX switch (See page 11.)

Display Window



1 VTR indicator (See page 8.)

2 Linear time counter and clock (See page 13.)

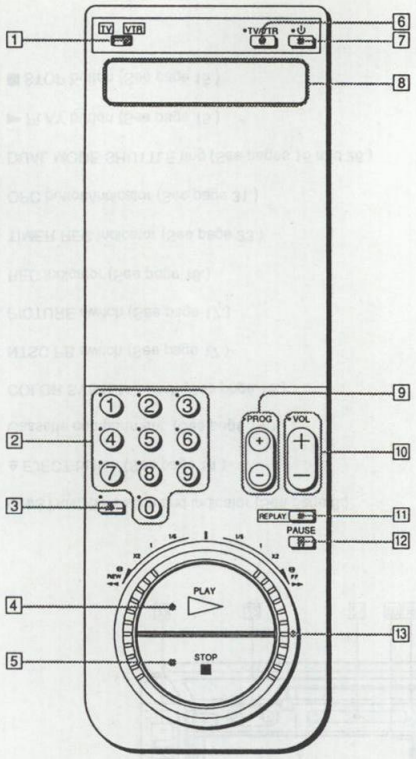
3 Tape speed indicator (See page 19.)

4 Line and programme position indicator (See page 8.)

5 PDC indicator (See page 25.)

6 AUTO TRACKING indicator (See page 17.)

7 Cassette indicator (appears when a cassette is loaded) (See page 14.)



Remote Commander (with cover closed)

1 TV/VTR remote control selector (See page 6.)

2 Programme position number buttons (See pages 10 and 18.)

3 –/-- (10s digit button) (See pages 10 and 18.)

4 ► PLAY button (See page 15.)

5 ■ STOP button (See page 15.)

6 TV/VTR button (See page 8.)

7 ⏻ (on/standby) button (See page 8.)

8 Liquid-crystal display (LCD) (See page 12.)

9 PROG +/– (programme) button (See page 8.)

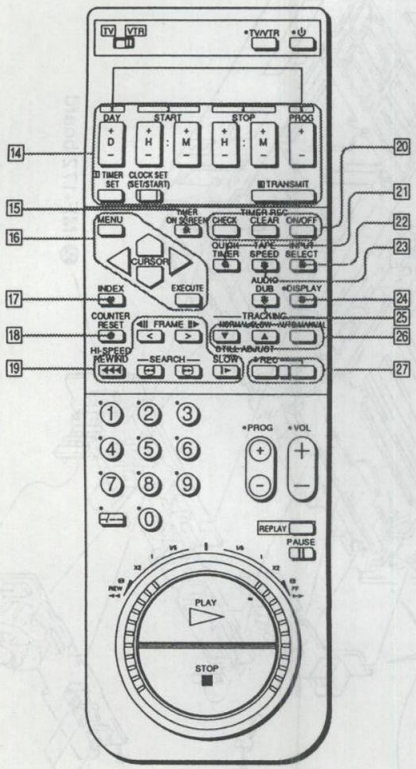
10 VOL +/– (volume) button (Press + to increase the volume and – to decrease it.)

11 REPLAY button (See page 27.)

12 ❚❚ PAUSE button (See pages 15 and 26.)

13 DUAL MODE SHUTTLE ring (See pages 15 and 26.)

(Continued)



Remote Commander (with cover opened)

14 Timer recording/clock buttons (See pages 12 and 20.)
- 1 TIMER SET button
  CLOCK SET (SET/START) button
- 2 DAY button
- 3 START time buttons
- 4 STOP time buttons
- 5 PROG +/– (programme position) button
- 6 TRANSMIT button

15 TIMER ON SCREEN button (See page 24.)

16 Menu operations buttons (See page 9.)
- MENU button
- Cursor buttons (▲/▼/◀/▶)
- EXECUTE button

17 INDEX button (See page 29.)

18 COUNTER RESET button (See page 16.)

19 Tape transport buttons
- ◀◀◀ HI-SPEED REWIND button (See page 15.)
- ⏪/⏩ SEARCH buttons (See page 26.)
- </> ◀II FRAME II▶ buttons (See page 26.)
- I► SLOW button (See page 26.)

20 TIMER REC buttons (See page 25.)
- CHECK button (See page 25.)
- CLEAR button (See page 25.)
- ON/OFF button (See page 21.)

21 QUICK TIMER button (See page 23.)

22 INPUT SELECT button (See page 8.)

23 TAPE SPEED button (See page 19.)

24 DISPLAY button (See page 16.)

25 AUDIO DUB button (See page 34.)

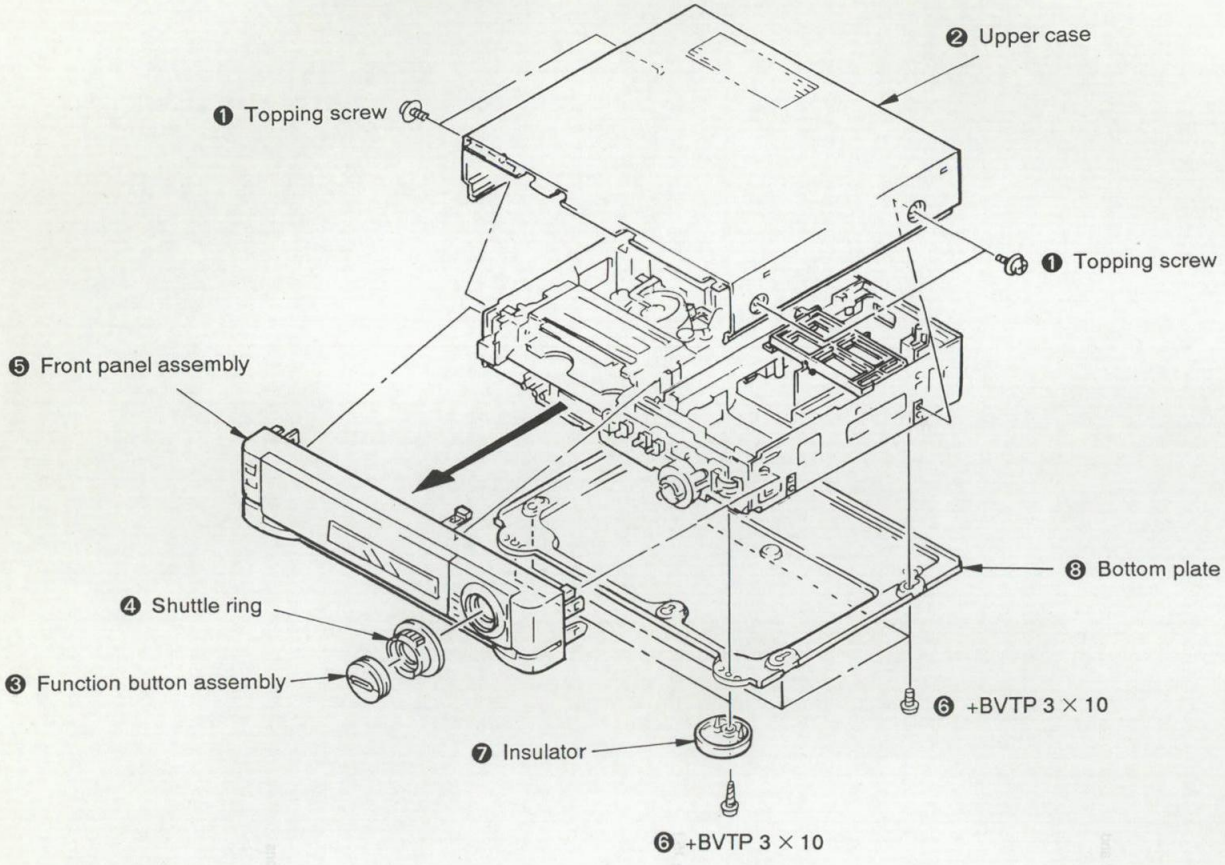
26 TRACKING buttons (See page 17.)
- ▼/▲ NORMAL/SLOW STILL ADJUST buttons
- AUTO/MANUAL button

27 ● REC buttons (See page 18.)

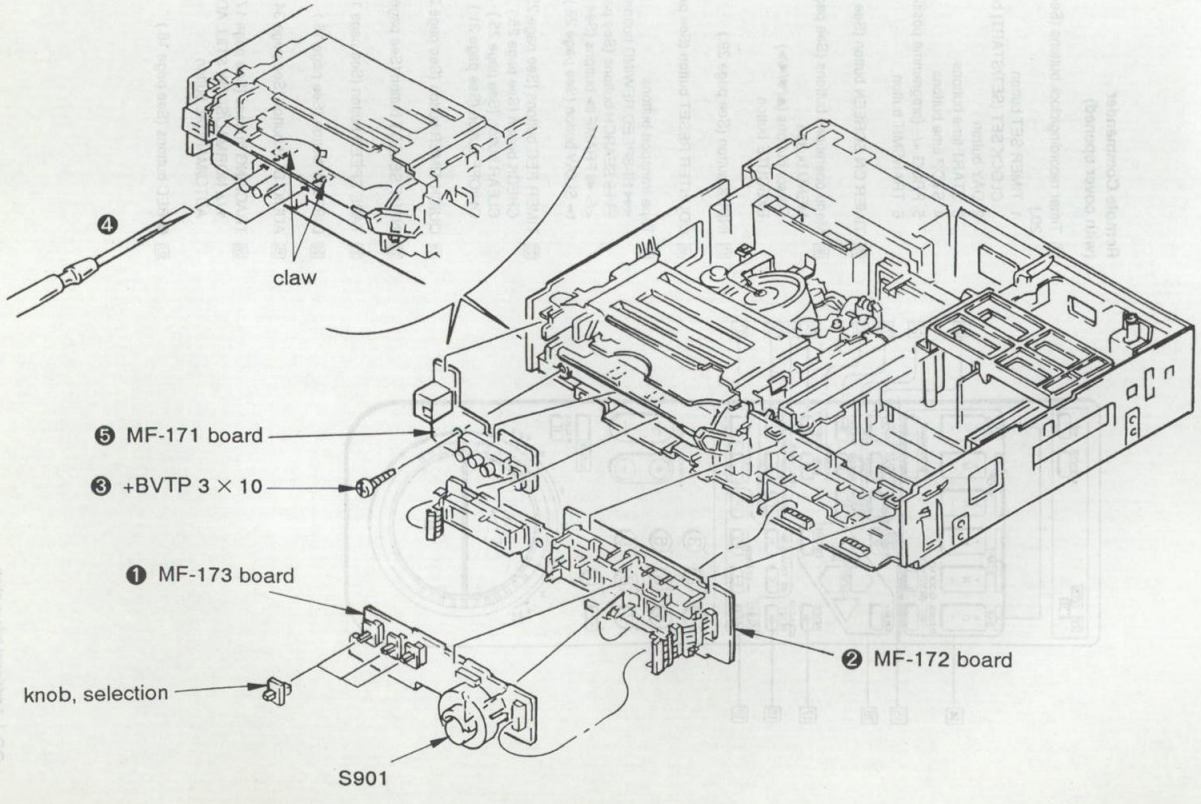
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

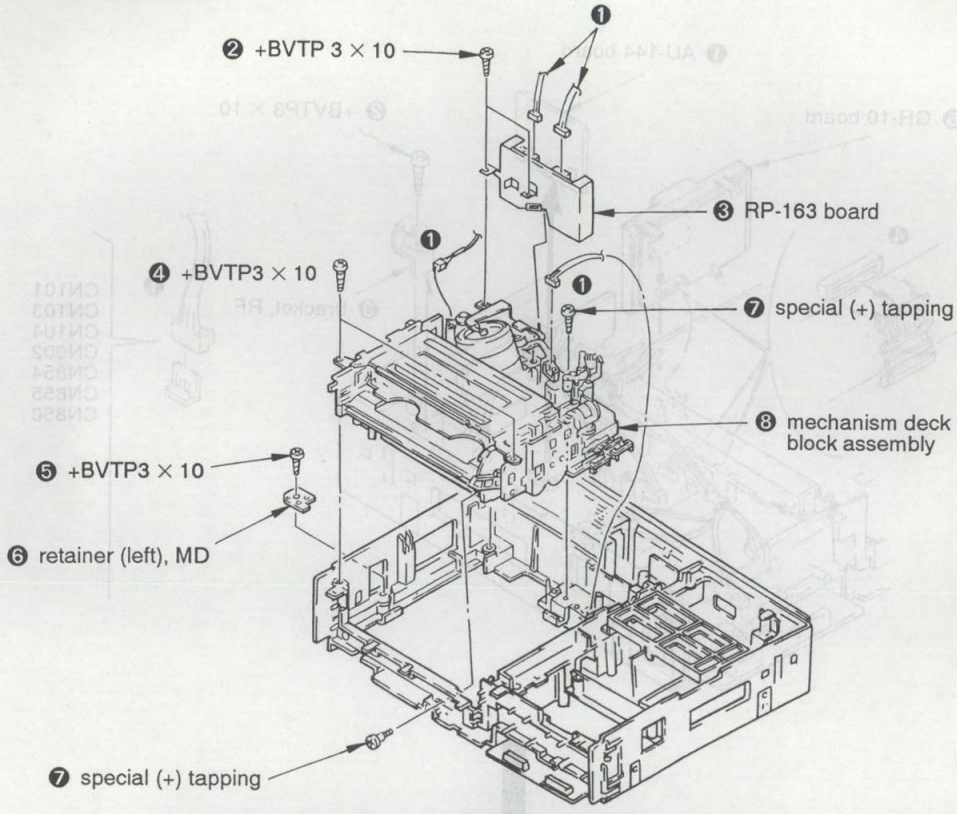
2-1. FRONT PANEL ASSEMBLY AND UPPER CASE



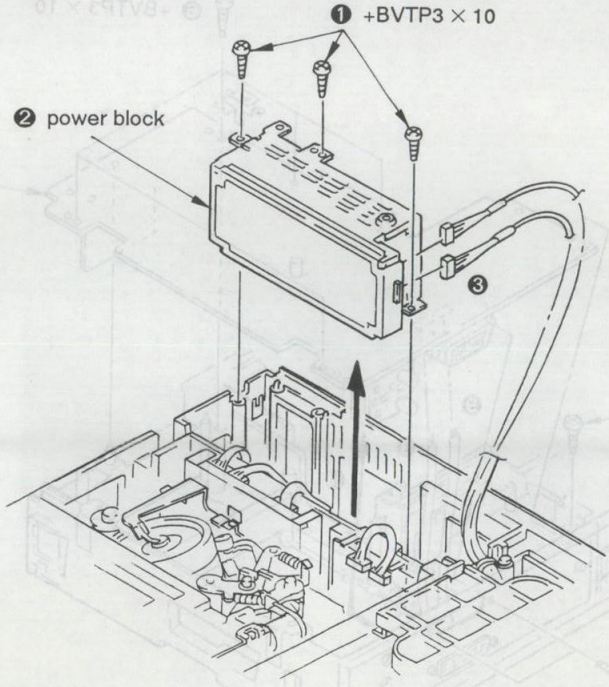
2-2. MF-171, MF-172, MF-173 BOARDS



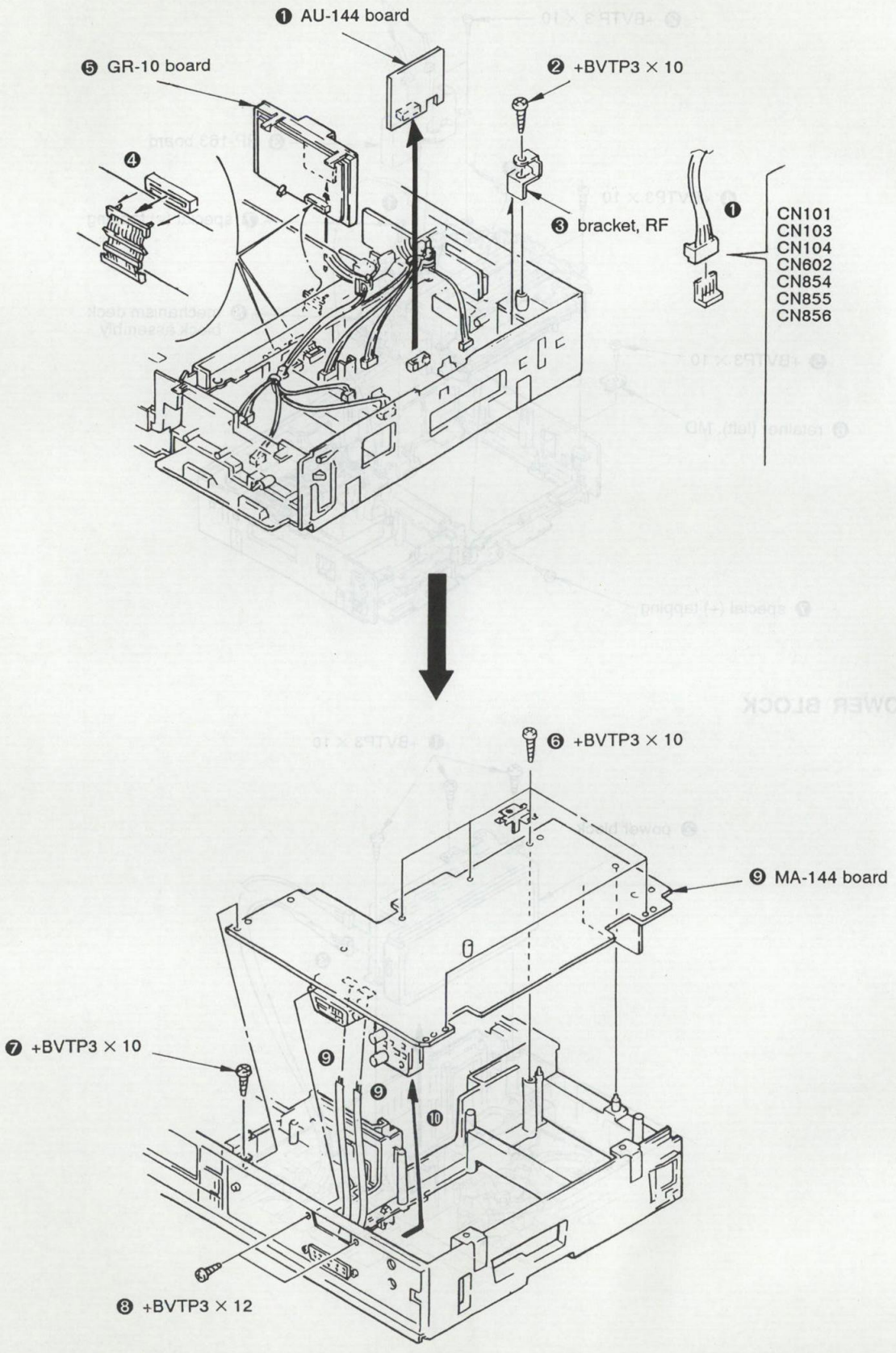
2-3. RP-163 BOARD AND MECHANISM DECK BLOCK ASSSEMBLY



2-4. POWER BLOCK

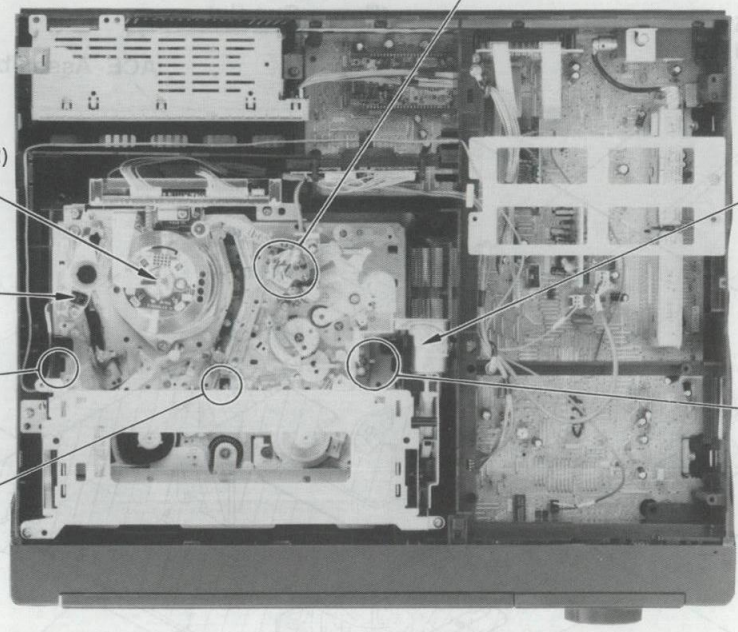


2-5. AU-144, GR-10, MA-144 BOARDS

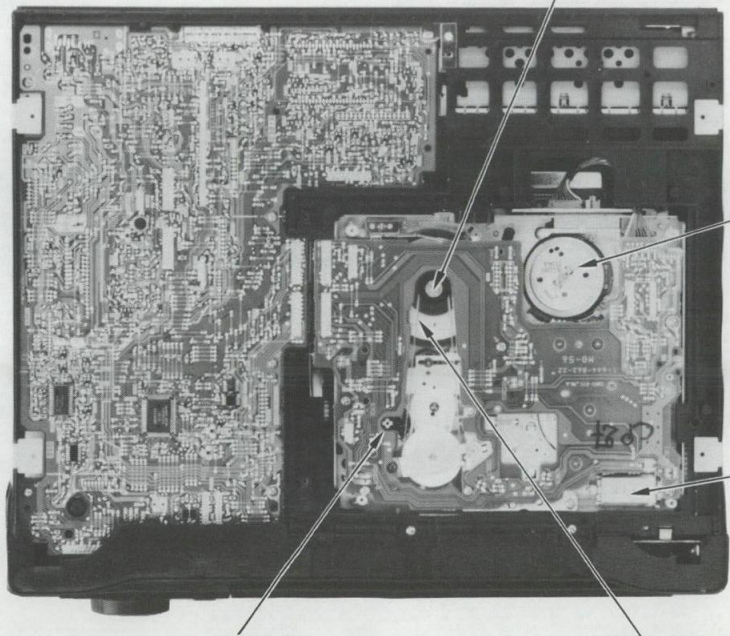


2-6. INTERNAL VIEWS

– Top Side –

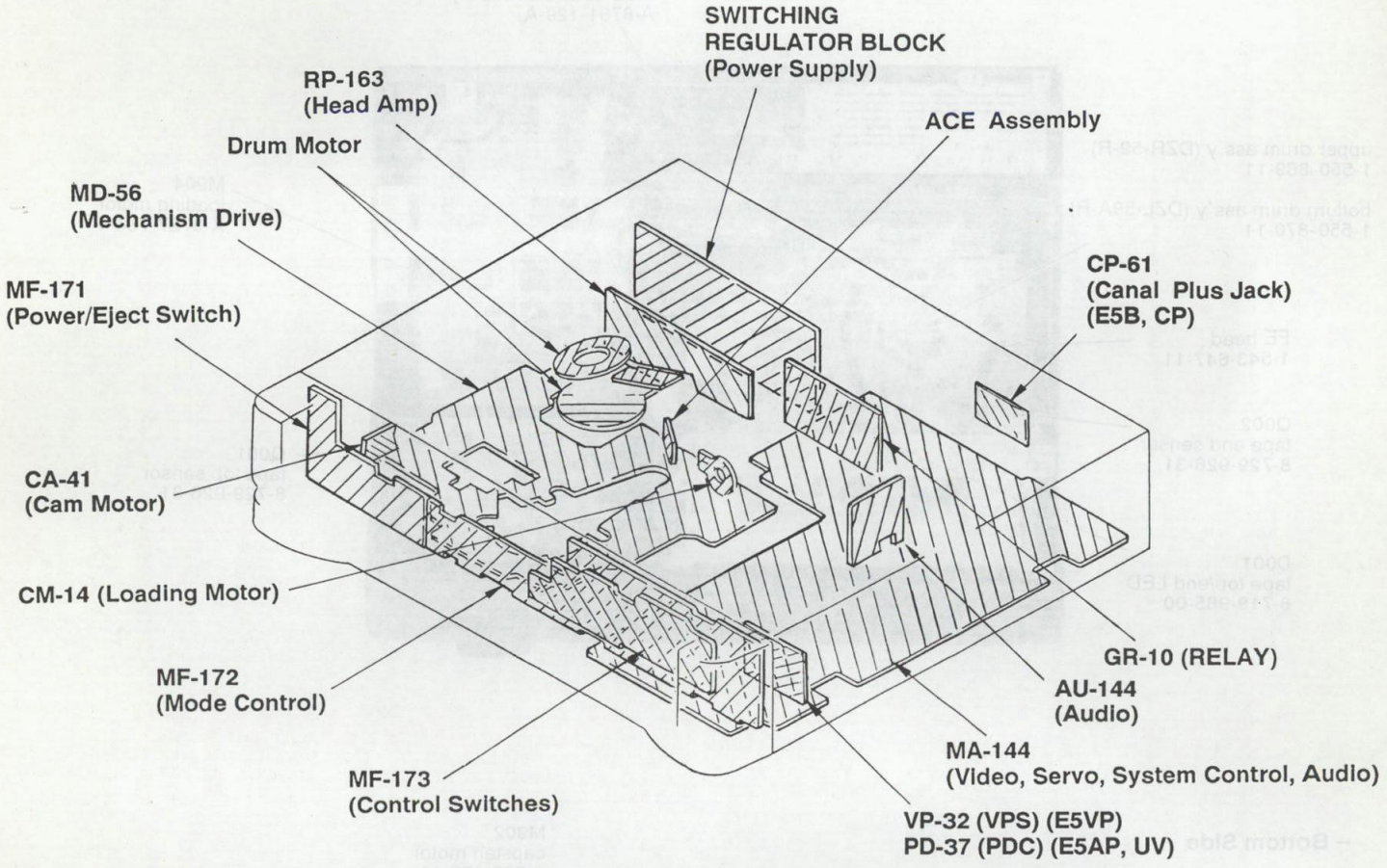


– Bottom Side –



SECTION 3
DIAGRAMS

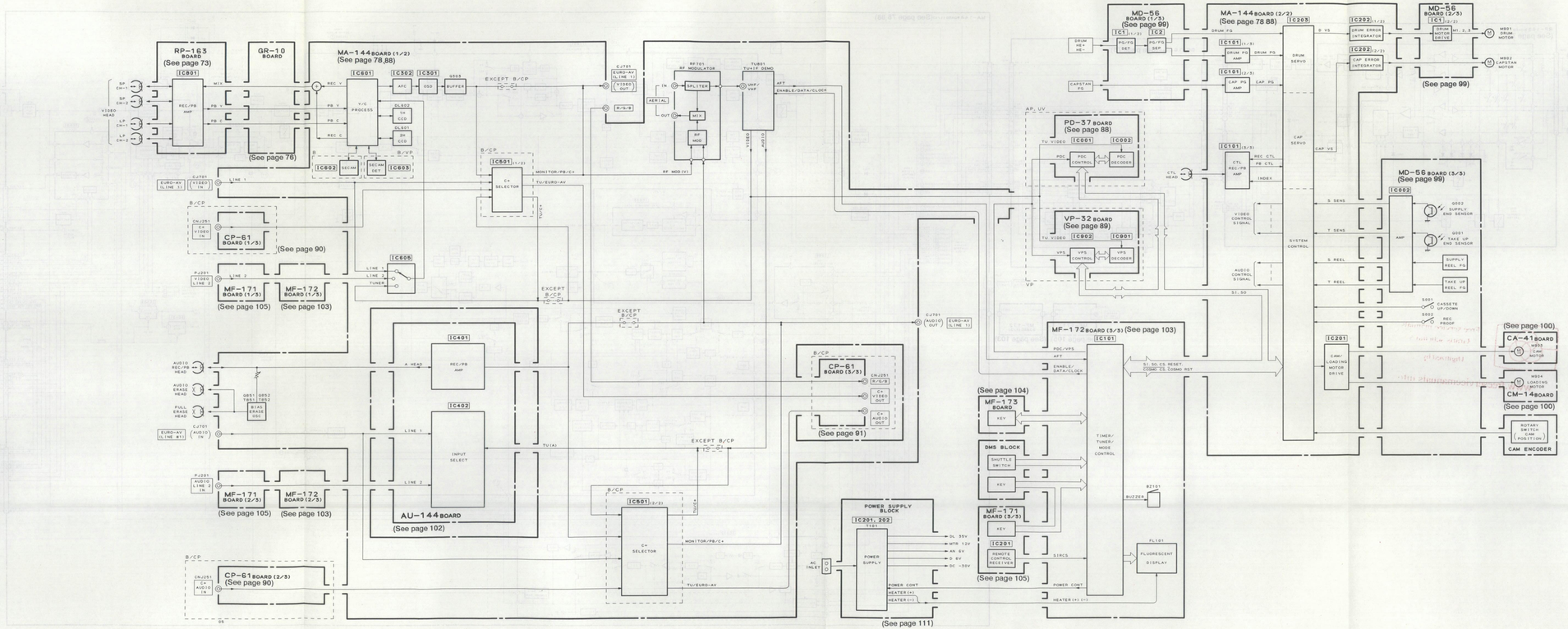
3-1. CIRCUIT BOARDS LOCATION



3-2. OVERALL BLOCK DIAGRAM

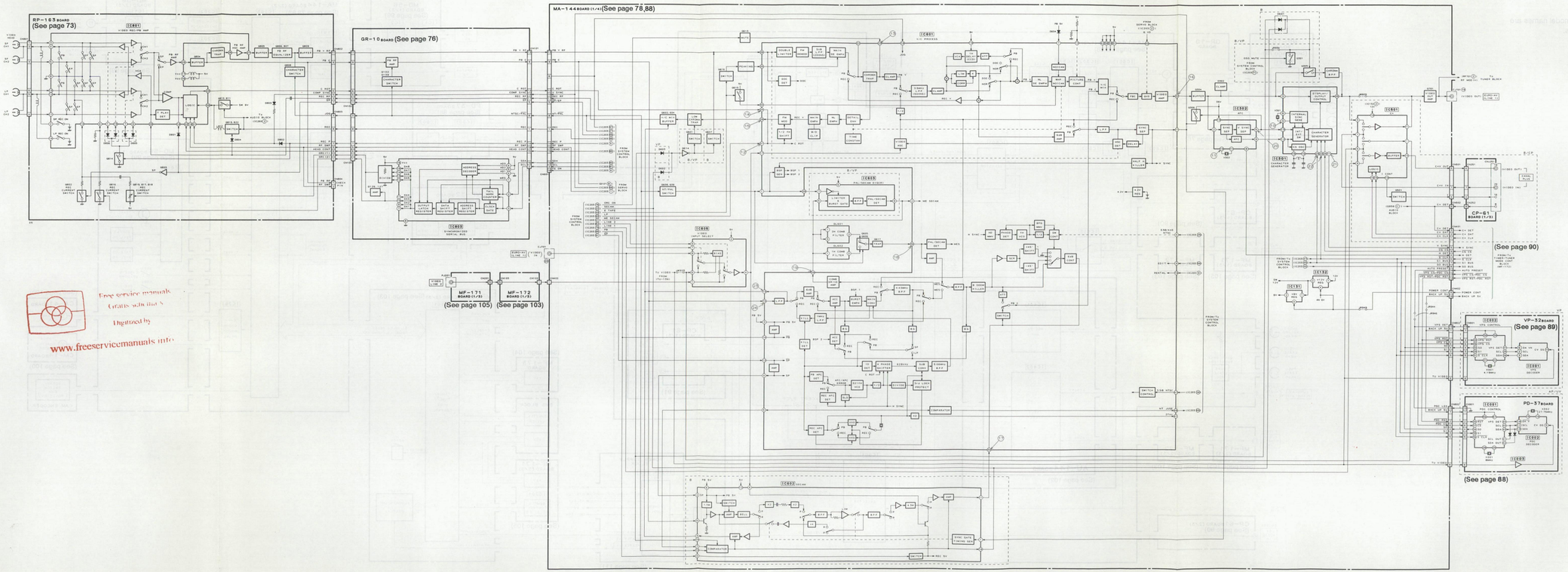
- In the diagrams, the model names are abbreviated as follows.

SLV-E5AE	: AE
SLV-E5AP	: AP
SLV-E5B	: B
SLV-E5CP	: CP
SLV-E5EI	: EI
SLV-E5IT	: IT
SLV-E5VP	: VP
SLV-E6UV	: UV



3-3. VIDEO BLOCK DIAGRAM

- Circled numbers refer to waveforms on page 75 to 77 for RP-163 board, pages 87 and 95 for MA-144 board.



3-4. SYSTEM CONTROL – VIDEO BLOCK INTERFACE

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB• PAUSE	SLOW	×2	CUE	REVIEW	REC	REC• PAUSE
$\overline{\text{V•PB}}$	MA-144 IC203 ㉟	O	H	H	H	L	L	L	L	L	L	H	H
HEAD CONT	MA-144 IC203 ㊺	O	L	L	L	L	HI-Z (2.5 V)	*1	*10	*5	*5	L	L
RF SW P (SW30)	MA-144 IC203 ①	O	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
Q VD/V MUTE	MA-144 IC203 ②	O	L	L	L	*3	*4	*4	*4	*4	*4	L	L
$\overline{\text{SP}}$	MA-144 IC203 ㉛	O	*6	*6	*6	*7	*7	*7	*7	*7	*7	*6	*6
EP	MA-144 IC203 ㉜	O	*12	*12	*12	*7	*7	*7	*7	*7	*7	*12	*12
LP	MA-144 IC203 ㉝	O	*13	*13	*13	*7	*7	*7	*7	*7	*7	*13	*13
REC•P	MA-144 IC203 ⑤	O	L	L	L	L	L	L	L	L	L	L	H
REC	MA-144 IC203 ㊽	O	L	L	L	L	L	L	L	L	L	H	H
V SYNC	MA-144 IC203 ㊻	I	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8
$\overline{\text{OSD MUTE}}$	MA-144 IC203 ㊶	O	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
EDIT	MA-144 IC203 ㊹	O	*11	*11	*11	*14	*14	*14	*14	*14	*14	*11	*11
E TAPE	MA-144 IC203 ㊾	O	H	H	H	*15	*15	*15	*15	*15	*15	H	H
RENTAL	MA-144 IC203 ⑨	O	L	L	L	*16	*16	*16	*16	*16	*16	L	L
NTSC/$\overline{\text{PAL}}$	MA-144 IC203 ㉗	O	*17	*17	*17	*18	*18	*18	*18	*18	*18	*17	*17
3.58NTSC	MA-144 IC203 ㉖	O	*19	*19	*19	*20	*20	*20	*20	*20	*20	*19	*19
3.58/4.43NTSC	MA-144 IC203 ㉕	O	*17	*17	*17	*21	*21	*21	*21	*21	*18	*17	*17
JOG	MA-144 IC203 ㊼	O	L	L	L	L	H	H	H	H	H	L	L
SECAM	MA-144 IC203 ㉒	I/O	*22	*22	*23	*24	*24	*24	*24	*24	*24	*22	*22
MESECAM	MA-144 IC203 ㉑	I/O	*22	*22	*23	*23	*23	*23	*23	*23	*23	*22	*22
ORC SEttei	MA-144 IC203 ㊻	O	L	L	L	L	L	L	L	L	L	*25	*25
$\overline{\text{ORC SEttei}}$	RP-149 IC803 ⑦	O	H	H	H	H	H	H	H	H	H	*26	*26
$\overline{\text{E TAPE}}$	RP-149 IC803 ⑨	O	L	L	L	*27	*27	*27	*27	*27	*27	L	L
ORC DEFAULT	RP-149 IC803 ⑩	O	*28	*28	*28	H	H	H	H	H	H	*28	*28
NTSC	RP-149 IC803 ⑪	O	*17	*17	*17	*18	*18	*18	*18	*18	*18	*17	*17

*1. Foward slow mode: "HI-Z (2.5 V)" in tape stop, "L" in tape running (approx. 40 msec.).
Foward slow mode: "HI-Z (2.5 V)" in tape stop, "H" in tape running SP mode (approx. 40 msec.).
"L" in tape running EP mode (approx. 40 msec.).
*2. Synchronized with drum rotation. 30 Hz 50% duty pulse.
*3. Normally "L". "H" when CTL signal is not generated.
*4. V period "H" pulse.
*5. "H" in SP mode. "L" in EP mode.
*6. Selected by REC mode. SP mode: "L".
*7. Selected by tape recording mode.

Signal \ Model	SP	LP	EP
$\overline{\text{SP}}$ ㉛	L	H	H
EP ㉜	L	L	H
LP ㉝	L	H	L

*8. Composite Sync signal (positive).
*9. "L" when menu screen or blue back screen.
*10. "HI-Z (2.5 V)" in EP mode. "H" in SP mode.
*11. Selected by "PICTURE SW": "H" in EDIT position.
*12. Selected by REC mode: "H" EP mode.
*13. Selected by REC mode: "H" LP mode.
*14. Selected by "PICTURE SW": "H" in EDIT position. "H" when "E TAPE" is "H" (Euro model, PAL PB).
*15. "L" when APC is off. "H" when APC is ON and "HG tape" is used.
*16. Selected by "PICTURE SW". "H" in RENTAL position or "H" when Low grade tape is used in APC ON mode.
*17. "H" when input signal is NTSC mode (GA-PAL model) (Euro-PAL mode).
"H" when input signal is NTSC mode (NTSC model).
*18. Selected by "Color system SW": "H" in NTSC mode (GA-PAL, Euro-PAL model).
"H" (NTSC model).
*19. "H" when input signal is NTSC3.58 mode (GA-PAL model).
"L" (Euro-PAL, NTSC model).
*20. Selected by "NTPB SW": "H" in NTSC3.58 position.
*21. Selected by "NTPB SW": "H" in NTSC3.58 or 4.43 position.
*22. "L" when input signal is NTSC mode, "HI-Z" in PAL/SECAM/MESECAM mode (GA-PAL, Euro-PAL model).
"L" (NTSC model).
*23. Selected by "Color system SW": "L" in NTSC mode, "HI-Z" in PAL/SECAM/MESECAM mode.
*24. Selected by "Color System SW": "L" in NTSC mode or PAL/SECAM/MESECAM – LP mode.
"HI-Z" in (PAL/SECAM/MESECAM) – SP mode.
*25. "H" during APC measurement.
*26. "L" during APC measurement.
*27. "H" when APC is off. "L" when APC is ON and "HG-tape" is used.
*28. "H" when APC is off or APc measurement is not done.

3-5. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB• PAUSE	SLOW	×2	CUE	REVIEW	REC	PEC• PAUSE	PB INDEX WRT/ERS
REC CTL	MA-144 IC203 ⑦	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	
$\overline{\text{CAP STOP}}$	MA-144 IC203 ㊳	O (O.D)	L	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	L	*3	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	
STEP PLS	MA-144 IC203 ㉔	O	L	L	L	L	L	L	L	*2	L	L	L	L	L	
CTL REC	MA-144 IC203 ㉘	O	L	L	L	L	L	L	L	L	L	L	L	H	H	H
INDEX	MA-144 IC203 ㉚	O	L	L	L	L	L	L	L	L	L	L	L	L	L	H
PB CTL	MA-144 IC203 ㊼	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H	
VD CTL	MA-144 IC203 ㊼	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H	
DRUM PG	MA-144 IC203 ㊽	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7	
DRUM FG	MA-144 IC203 ㊾	I	*4	*8	*8	*5	*5	*8	*8	*8	*8	*8	*8	*8	*8	
CAP FG	MA-144 IC203 ㊿	I	H/L	*6	*6	*5	*5	*6	H/L	*9	*6	*6	*6	*6	H/L	
CAP RVS	MA-144 IC203 ⑫	O	H/L	L	H	L	H	L	L	*2	L	L	H	L	L	
CAP DA	MA-144 IC203 ⑬	O	*10	*10	*10	*10	*10	*11	*10	*10	*11	*11	*11	*11	*10	
DRUM DA	MA-144 IC203 ⑭	O	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	
CTL STEP	MA-144 IC203 ㉙	O	L	L	L	L	L	L	L	*13	L	L	L	L	L	

*1. 30 Hz or 25 Hz pulse.
*2. Pulse at tape running.
*3. Reverse logic pulse of STEP PLS.
*4. "L" when drum rotation stop.
*5. Unstable period pulse.
*6. Pulse of period in proportion to tape speed.
*7. 30 Hz or 25 Hz pulse.
*8. 360 Hz or 300 Hz or 180/150 Hz pulse.
*9. Pulse at tape running.
*10. Approx. 2 msec period "H" or "L" pulse.
*11. Approx. 1.5 msec period "H" or "L" pulse.
*12. Approx. 3 msec period "H" or "L" pulse.
*13. "H" when FWD direction and STEP drive.

3-6. SYSTEM CONTROL – MECHANISM BLOCK INTERFACE

Signal	Pin No.	I/O	HI-SPEED REW	EJECTED	CASSETTE LOADING	CASSETTE UNLOAD-ING	TAPE THREAD-ING	TAPE UNTHREAD-ING	STOP	FF	REW	PB	PB• PAUSE	SLOW	×2	CUE	REVIEW	REC	PEC• PAUSE
CAM *1	MA-144 IC203 ⑫	O	L	L	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L
LOAD	MA-144 IC203 ⑭	O	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L
CW/CCW	MA-144 IC203 ⑬	O			H	L	H	L											
MODE 1	MA-144 IC203 ⑱	I	H	L	L	L	H	H	L	H	H	H	L	L	H	H	H	H	L
MODE 2	MA-144 IC203 ⑰	I	L	H	H	H	H	H	L	L	L	L	H	H	L	L	L	L	H
MODE 3	MA-144 IC203 ⑯	I	H	H	H	H	L	L	L	L	L	H	H	H	H	H	L	H	H
MODE 4	MA-144 IC203 ⑮	I	H	H	H	H	H	H	L	H	H	L	L	L	L	L	L	L	L
REC PRF	MA-144 IC203 ⑮	I	*2	L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
C-UP/DOWN	MA-144 IC203 ⑯	I	L	H	H→L	L→H	L	L	L	L	L	L	L	L	L	L	L	L	L
TREEL FG	MA-144 IC203 ⑭	I	*3	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
SREEL FG	MA-144 IC203 ⑬	I	*3	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
END LED	MA-144 IC203 ㉜	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP TRQ 1	MA-144 IC203 ㉝	O (O.D)	*1							*1	*1			*6		*1	*1		
CAP TRQ 2	MA-144 IC203 ㉞	O (O.D)								*1	*1								
$\overline{\text{CAP STOP}}$	MA-144 IC203 ㊳	O (O.D)	H	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
CAP RVS	MA-144 IC203 ⑫	O	H	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
CAP DA	MA-144 IC203 ⑬	O																	
T SENS	MA-144 IC203 ⑰	I	*7	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
S SENS	MA-144 IC203 ⑱	I	*7	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7

*1. "H" when mechanism mode transition.
*2. "L" when erasing protection tab is bent, "H" when not bent.
*3. Pause of period in proportion to reel rotating speed.
*4. Approx. 2 msec period "H" pulse.
*5. Pulse at tape running.
*6. "L" when tape running and CAP RVS is "H".
*7. Normally "L". 2 msec period "H" pulse when tape top or tape end is detected.

3-7. SYSTEM CONTROL – SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE

Signal	Pin No.	I/O	I/O level
$\overline{\text{COSMO•RESET}}$	MA-144 IC203 ㊵	I	Normally "H". "L" when service interruption is detected or restored.
$\overline{\text{COSMO•CS}}$	MA-144 IC203 ㊹	I	Chip select signal from timer microprocessor. V period "L" pulse.
SI•BUS	MA-144 IC203 ㊺	I	Serial communication data from timer microprocessor. V period "L" pulse.
SO•BUS	MA-144 IC203 ㊻	O	Serial communication data to timer microprocessor. V period "L" pulse.
S CLK	MA-144 IC203 ㊼	I	Serial communication clock with timer microprocessor. V period "L" pulse.

3-8. SYSTEM CONTROL – AUDIO BLOCK INTERFACE

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOAD-ING	PB	PB• PAUSE	SLOW	×2	CUE	REVIEW	REC	REC• PAUSE
AF PB	MA-144 IC203 ㊻	O	L	L	L	H	H	H	H	H	H	H	L
STEREO/L/$\overline{\text{R}}$	MA-144 IC203 ㊹	I/O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{HiFi}}$/M/N	MA-144 IC203 ㊸	I/O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
AF ENVELOP	MA-144 IC203 ㊶	I	AF RF envelope signal input terminal for automatic tracking.										
NA PB	MA-144 IC203 ⑪	O	L	L	L	H	H	H	H	H	H	L	L
A MUTE	MA-144 IC203 ㊲	O (O.D)	L	L	L	*4	H	H	H	H	H	L	L
$\overline{\text{SP}}$	MA-144 IC203 ㊶	O	*2	*2	*2	*3	*3	*3	*3	*3	*2	*2	*2
NA REC•$\overline{\text{P}}$	MA-144 IC203 ⑩	O	L	L	L	L	L	L	L	L	L	H	L
AF REC•$\overline{\text{P}}$	MA-144 IC203 ④	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	MA-144 IC203 ㊿	O	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
AF SW POSITION	MA-144 IC203 ㊶	I	Input terminal for AF switching position adjustment.										
FULL $\overline{\text{ERS}}$	MA-144 IC203 ㊱	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. Selected by audio monitor.

Signal \ Audio Monitor	STEREO OR MAIN, SUB, L, R	MAIN L	SUB R	(NORMAL)	HiFi MIX
STEREO/L/$\overline{\text{R}}$	H	M (HI-Z)	L	X	H
$\overline{\text{HiFi}}$/M/N	L	L	L	H	M (HI-Z)

*2. Selected by REC mode selector. SP mode: "L".
*3. Selected by tape recording mode. SP mode: "L".
*4. 30 Hz or 25 Hz, 50% duty pulse approx. 5 msec delayed from RF SW P.

3-9. SYSTEM CONTROL – TUNER BLOCK INTERFACE

Signal	Pin No.	I/O	I/O level
TAMUTE	MA-144 IC203 ㉓	O	Tuner audio mute output. "H" when not used channel is selected.

3-10. SYSTEM CONTROL AND RF MODULATOR – INPUT SELECTION BLOCK INTERFACE

Signal	Pin No.	I/O	I/O level
AV CONT	MA-144 IC203 ⑲	O	"L" when RF modulator through.
LINE 1	MA-144 IC203 ㊾	O	*1. Input select control signal.
LINE 2	MA-144 IC203 ㉒	O	

*1.

Signal \ Input	Tuner	LINE 1	LINE 2
LINE 1 ㊾	L	H	L
LINE 2 ㉒	L	L	H

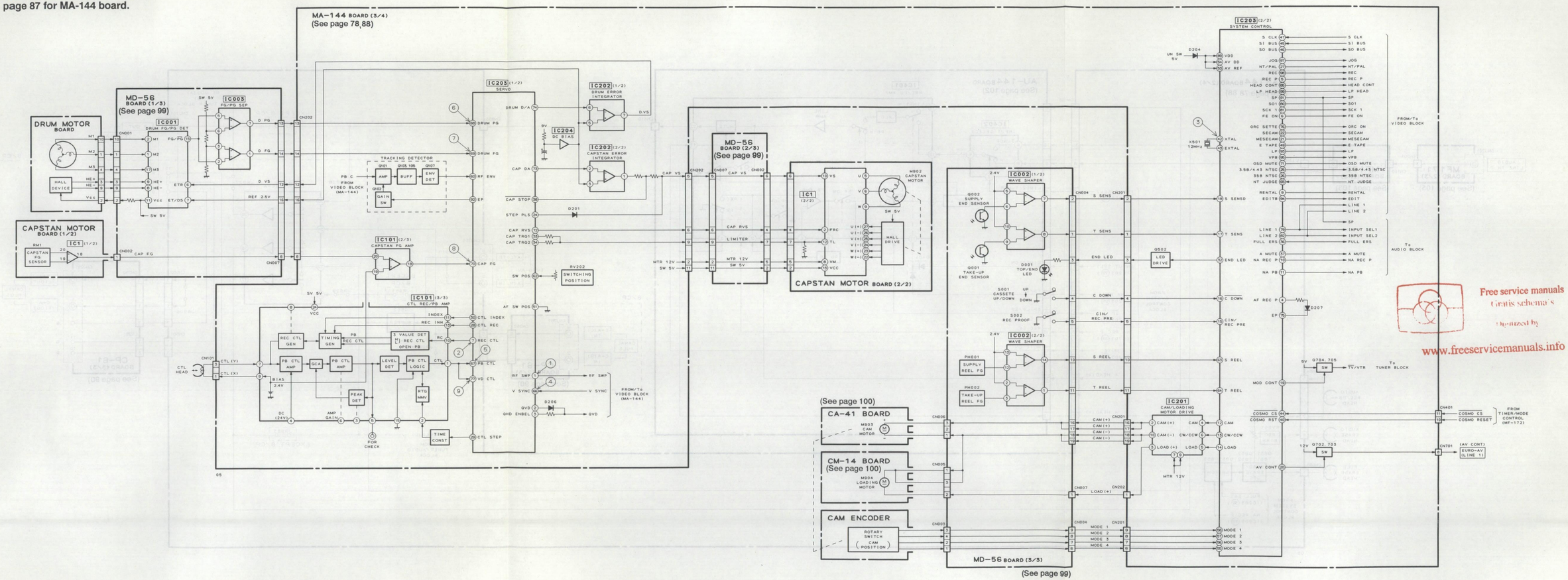
3-11. SERVO SYSTEM CONTROL – MICROPROCESSOR PIN FUNCTION (MA-144 BOARD IC203)

Pin No.	Port	I/O	Signal	Function
1	PB5/PPO13	O	RF SWP	Video switching pulse output
2	PB4/PPO12	O	Q VD	False VD pulse output
3	PB3/PPO11	O	Q HD ENBL	False HD voltage level control
4	PB2/PPO10	O	AF REC $\overline{P}$	"H" output when hi-fi audio REC
5	PB1/PPO9	O	RECP	"H" output when video REC•PAUSE
6	PB0/PPO8	O	FE ON	Flaying erase ON/OFF
7	PC7/RTO7	O	REC CTL	REC CTL output
8	PC6/RTO6	O	INT VD	Internal VD signal. Not used
9	PC5/RTO5	O	RENTAL	"H" output when "RENTAL" or "Low grade TAPE" PB
10	PC4/RTO4	O	NA $\overline{RECP}$	"H" when normal audio REC
11	PC3/RTO3	O	NA PB	"H" when normal audio playback
12	PC2/PPO18	O	CAM	CAM motor select
13	PC1/PPO17	O	CW	Clockwise/counterclockwise signal output
14	PC0/PPO16	O	LOAD	Load motor select
15	PJ7	I	CIN/REC PRF	Erasing protection tab, cassette IN detection input
16	PJ6	I	C DOWN	Cassette up/down detection input
17	PJ5	I	T SENS	T end sensor input
18	PJ4	I	S SENS	S end sensor input
19	PJ3	O	MOD CONT	RF modulator ON/OFF control
20	PJ2	O	AV CONT	Euro 21pin TV/VTR control
21	PJ1	I/O	MESECAM	"L" in NT mode. "HI-Z" in PAL (50 Hz) mode
22	PJ0	I/O	SECAM	"L" in NT mode. "HI-Z" in PAL (50 Hz) mode
23	PD7	O	TA MUTE	Tuner audio MUTE signal
24	PD6	O	STEP PLS	"H" when capstan step drive
25	PD5	O	3.58/4.43 NTSC	"H" when 3.58 or 4.43 NTSC PB
26	PD4	O	3.58 NTSC	"H" when 3.58 NTSC PB
27	PD3	O	NTSC/$\overline{PAL}$	"H" when NTSC mode
28	PD2	O	CTL REC	"H" when CTR writing
29	PD1	O	CTL STEP	STEP motion control of CTL amp
30	PD0	O	INDEX	Index control. "H" when playback index writing or erasing
31	PH7	O		Not used
32	PH6	O	END LED	END sensor lamp drive output
33	PH5	O	CAP TPQ2	Capstan current control. "L" when FF/REW ➡ stop
34	PH4	O	CAP TPQ1	Capstan current control. "L" when slow down
35	PH3	O	PAL	"H" when PAL mode
36	PH2	O	$\overline{FULL\ ERS}$	"L" when full erase head operation
37	PH1	O	A MUTE	Audio MUTE output
38	PH0	O	$\overline{CAP\ STOP}$	Capstan STOP signal output
39	MP	I	MP	Fixed at "L" level
40	$\overline{RST}$	I	$\overline{COSMO\ RST}$	System reset input
41	Vss			GND
42	XTAL		XTAL	System clock 12 MHz
43	EXTAL		EXTAL	
44	$\overline{CSO}$	I	$\overline{COSMO\ CS}$	Chip select signal
45	SI0	I	SI0	Signal for serial communication
46	SO0	O	SO0	
47	$\overline{SCK0}$	I	$\overline{SCK0}$	
48	PF7/AN11	O	AMS MUTE	Not used
49	PF6/AN10	O	E TAPE	"H" when "HG-TAPE" PB

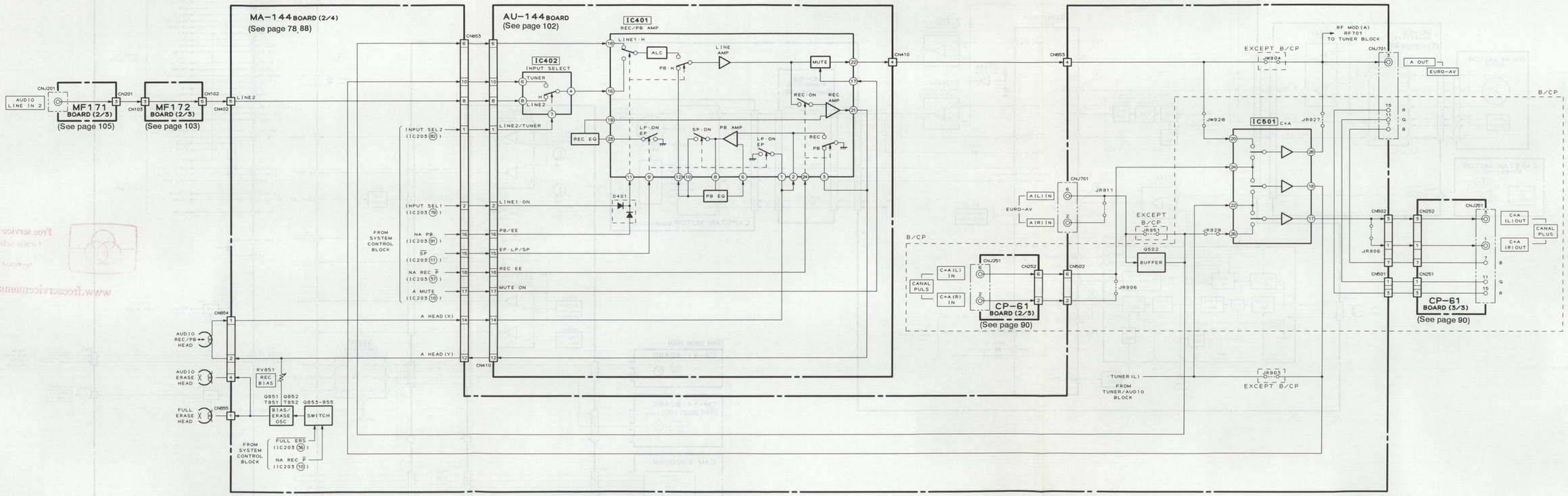
Pin No.	Port	I/O	Signal	Function
50	PF5/AN9	I	K MODE	Not used
51	PF4/AN8	I	AF SW POSI	VR input for hi-fi switching pulse position adjustment
52	AVss		AVss	GND
53	AVREF		AVREF	AD port reference input. UNSW 5 V
54	AVDD		AVDD	UNSW 5 V
55	PF3/AF7	I	MODE4	Mechanism section CAM encoder input
56	PF2/AN6	I	MODE3	
57	PF1/AN5	I	MODE2	
58	PF0/AN4	I	MODE1	
59	AN3	I	DEW	DEW sensor input
60	AN2	I	RF ENV	Video RF envelope input
61	AN1	I	AF ENV	hi-fi audio RF envelope input
62	AN0	I	RF SW POSI	VR input for SWP adjustment
63	PG7/EXI1	I	SREEL FG	S reel sensor input
64	PG6/EXI0	I	TREEL FG	T reel sensor input
65	PG5/SYNC1	I	NT JUDGE	3.58/4.43 NTSC judgement input
66	PG4/SYNC0	I	V SYNC	Composite sync input
67	PG3/$\overline{\text{PBCTL}}$	I	PB CTL	Playback CTL input
68	PG2/DPG	I	DRM PG	Drum PG input
69	PG1/DFG	I	DRM FG	Drum FG input
70	PG0/CFG	I	CAP FG	Capstan FG input
71	PE7/DAB1	O	OSD MUTE	Video putput mute signal
72	PE6/DAB0	O	CAP RVS	Capstan reverse signal output
73	PE5/DAA1	O	CAP D/A	Capstan error D/A output
74	PE4/DAA0	O	DRM D/A	Drum error D/A output
75	PE3/PWM1	O	$\overline{\text{EP}}$	"L" when EP mode REC/PB
76	PE2/PWM0	O	ORC SETTEI	"H" when ORC measurement
77	PE1/EC/INT	I	VD CTL	Playback CTL input
78	PE0/INTO	I	AMS IN	Not used
79	PI7/SIL	O	LINE1	Video/audio input select signal
80	PI6/SOL	O	EXP SO	Expansion port serial communication
81	PI5/$\overline{\text{SCKL}}$	O	EXP CLK	
82	PI4/INT1	O	LINE2	Video/audio input select signal
83	PI3/TO	I/O	$\overline{\text{Hi/Fi}}$/M/N	Audio output control signal
84	PI2/PWM	I/O	STEREO/L/$\overline{\text{R}}$	
85	PI1/PO	I/O	HEAD CONT	Head select control
86	TEX	I		Not used
87	TX	O		Not used
88	Vss			GND
89	VDD			UNSW 5 V
90	N.C.			Connected to UNSW 5 V
91	PA7/PPO7	O	$\overline{\text{SP}}$	"L" when SP mode
92	PA6/PPO6	O	ENV GAIN	RF envelope gain control
93	PA5/PPO5	O	LP	"H" when LP mode
94	PA4/PPO4	O	EDIT	"H" when EDIT
95	PA3/PPO3	O	$\overline{\text{V PB}}$	"L" when video playback
96	PA2/PPO2	O	AF PB	"H" when hi-fi audio playback
97	PA1/PPO1	O	JOG	"H" when trick play mode
98	PA0/PPO0	O	REC	Rise up signal of head amp recording power
99	PB7/PPO15	O	LP HEAD	(PAL) Head select control
100	PB6/PPO14	O	AF SWP	hi-fi switching pulse output

3-12. SERVO, SYSTEM CONTROL BLOCK DIAGRAM

- Circled numbers refer to waveforms on page 87 for MA-144 board.



3-13. AUDIO BLOCK DIAGRAM

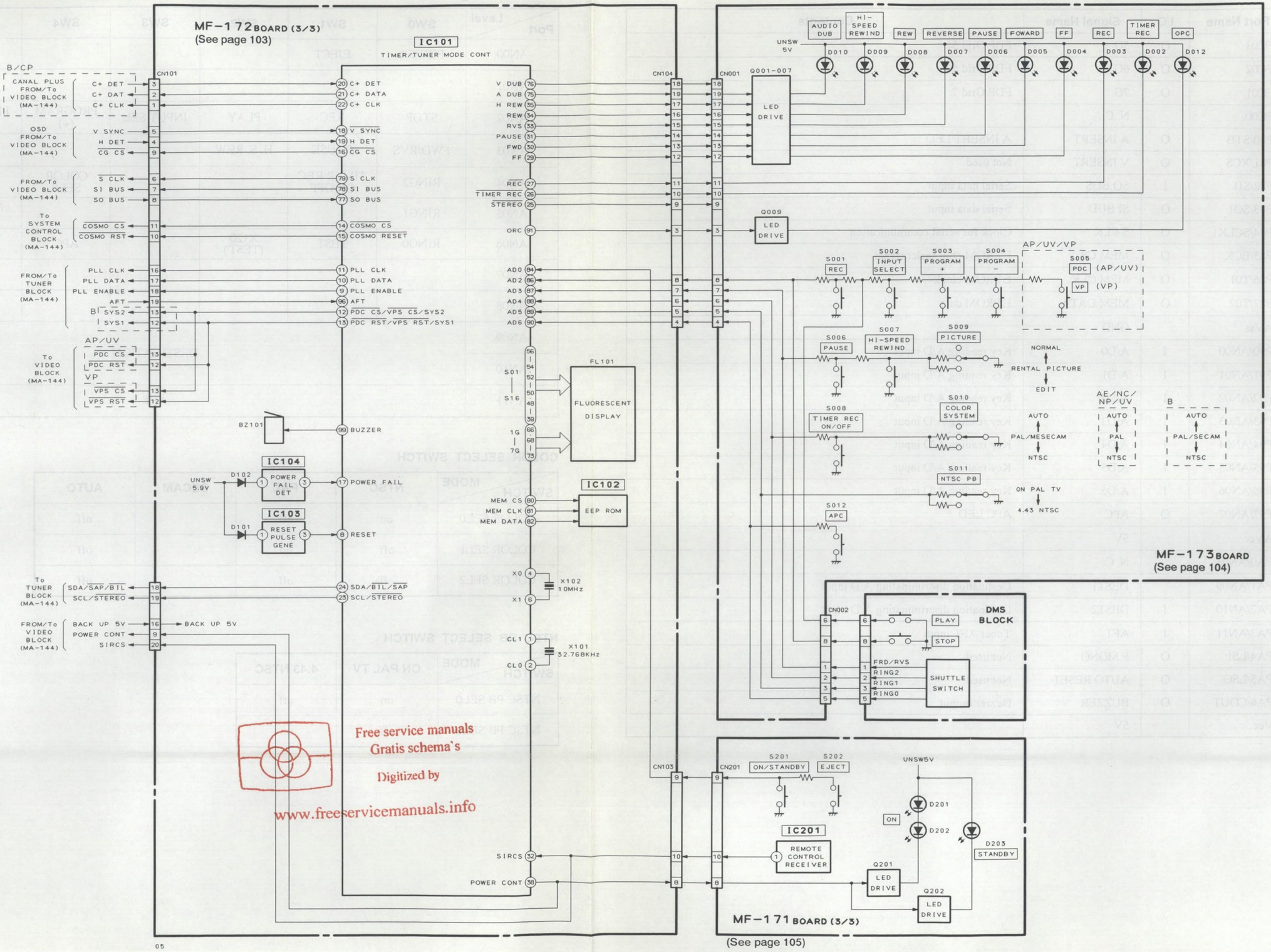


3-14. TIMER, TUNER MODE CONTROL MICROCOMPUTER PIN FUNCTION (MF-172 BOARD IC101 MB89905-VSX1910)

No.	Port Name	I/O	Signal Name	Contents
1	CL1		32K X'tal	Connect oscillator for clock
2	CL0		32K X'tal	Connect oscillator for clock
3	MOD0		GND	
4	MOD1		GND	
5	X0		X'tal	Connect main oscillator
6	X1		X'tal	Connect main oscillator
7	Vss		GND	
8	XRST	I	$\overline{\text{RESET}}$	Reset signal input
9	P00/E120	O	PLL ENABLE	Tuner enable signal
10	P01/E121	O	PLL DATA	Tuner data signal
11	P02/E122	O	PLL CLOCK	Tuner clock signal
12	P03/E123	O	SYS2/$\overline{\text{VPS CS}}$/$\overline{\text{PD CCS}}$	Tuner system select signal 2 (E7B) VPS chip select (E7VP), PDC chip select (E7AP/UY/E8UV)
13	P04/E124	O	SYS1/$\overline{\text{VPS RST}}$/$\overline{\text{PDC RST}}$	Tuner system select signal 1 (E7B) VPS reset (E7VP), PDC reset (E7AP/UY/E8UV)
14	P05/E125	O	$\overline{\text{COSMO CS}}$	System control chip select signal
15	P06/E126	O	$\overline{\text{COSMO RESET}}$	System control reset signal
16	P07/E127	O	$\overline{\text{CG CS}}$	Character generator chip select signal
17	P10/E110	I	$\overline{\text{POWER FAIL}}$	Power failure detect signal input
18	P11/E111	I	$\overline{\text{V SYNC}}$	V sync. signal input
19	P12/E112	I	H DET	Video signal detect signal input
20	P13/E113	I	C+ DET	CANAL +detection
21	P14	O	C+ DATA	CANAL +control data
22	P15	O	C+ CLK	CANAL +control clock
23	P16	I	SCL	I^2C BUS (Clock)
24	P17	I	SDA	I^2C BUS (Data)
25	P20	O	$\overline{\text{STEREO}}$	Stereo, bilingual, HiFi LED
26	P21	O	$\overline{\text{TIMER}}$	TIMER LED
27	P22	O	$\overline{\text{REC}}$	REC LED
28	CMOD		GND	
29	P24/SI0	O	FF	FF LED
30	P25/SO0	O	FWD	FWD LED
31	P26/SCLK0	O	PAUSE	PAUSE LED
32	P27/RMCI	I	SIRCS IN	SIRCS signal input
33	P30	O	RVS	RVS LED
34	P31	O	REW	REW LED
35	P32	O	H. S. REW	H. S. REW LED

No.	Port Name	I/O	Signal Name	Contents
36	P33/PWMO	O	SAP/$\overline{\text{MAIN}}$	Not used
37	P34/PPGO	O	N. C.	
38	P35/PPGI	O	POWER CONT	Power ON/OFF control signal
39	FS00	O	S16	FDP Segment 16
40	FS01	O	S15	FDP Segment 15
41	FS02	O	S14	FDP Segment 14
42	FS03	O	S13	FDP Segment 13
43	FS04	O	S12	FDP Segment 12
44	FS05	O	S11	FDP Segment 11
45	FS06	O	S10	FDP Segment 10
46	FS07	O	S09	FDP Segment 9
47	FS08	O	S08	FDP Segment 8
48	FS09	O	S07	FDP Segment 7
49	Vcc	O	5V	
50	FS10	O	S06	FDP Segment 6
51	FS11	O	S05	FDP Segment 5
52	FS12	O	S04	FDP Segment 4
53	Vfdp		−30V	
54	FS13	O	S03	FDP Segment 3
55	FS14	O	S02	FDP Segment 2
56	FS15	O	S01	FDP Segment 1
57	FS16		N. C.	
58	Vss		GND	
59	FS17		N. C.	
60	FS18		N. C.	
61	FS19		N. C.	
62	FC10/FS20		N. C.	
63	FC10/FS21		N. C.	
64	FC09/FS22		N. C.	
65	FC08/FS23		N. C.	
66	FC07	O	1G	FDP Grid 1
67	Vcc		5V	
68	FC06	O	2G	FDP Grid 2
69	FC05	O	3G	FDP Grid 3
70	FC04	O	4G	FDP Grid 4

3-15. TIMER, TUNER, MODE CONTROL BLOCK DIAGRAM



No.	Port Name	I/O	Signal Name	Contents
71	FC03	O	5G	FDP Grid 5
72	FC02	O	6G	FDP Grid 6
73	FC01	O	7G	FDP Grid 7
74	FC00		N. C.	
75	P80/STB	O	A INSERT	A INSERT LED
76	P81/XCS	O	V INSERT	Not used
77	P82/SI1	I	SO BUS	Serial data input
78	P83/SO1	O	SI BUD	Serial data input
79	P84/SCLK1	O	S CLK	Clock for serial communication
80	P85/ECK	O	MEM CS	E^2PROM chip seelct signal
81	P86/T01	O	MEM CLK	E^2PROM clock
82	P87/T02	O	MEM DATA	E^2PROM data
83	AVss		GND	
84	P90/AN00	I	A/D0	Key reading A/D input
85	P91/AN01	I	A/D1	Key reading A/D input
86	P92/AN02	I	A/D2	Key reading A/D input
87	P93/AN03	I	A/D3	Key reading A/D input
88	P94/AN04	I	A/D4	Key reading A/D input
89	P95/AN05	I	A/D5	Key reading A/D input
90	P96/AN06	I	A/D6	Key reading A/D input
91	P97/AN07	O	APC	APC LED
92	AVcc		5V	
93	PA0/AN08		N. C.	
94	PA1/AN09		DEST1	Destination discriminating A/D input
95	PA2/AN10	I	DEST2	Destination discriminating A/D input
96	PA3/AN11	I	AFT	Tuner AFT input
97	PA4/LSI	O	F MONO	Not used
98	PA5/LSO	O	AUTO RESET	Not used
99	PA6/COUT	O	BUZZER	Buzzer output
100	Vcc		5V	

A/D Port Assignment

Port \ Level	SW0	SW1	SW2	SW3	SW4	SW5	SW6
AN00	POWER	EJECT					
AN01							
AN02	STOP	REC	PLAY	INPUT SEL	PROGRAM (+)	PROGRAM (−)	TV/VTR (AS MODEL)
AN03	FWD/RVS	PAUSE	H. S. REW			EDIT	RENTAL
AN04	RING2	TIMER REC ON/OFF			COLOR SEL0	COLOR SEL1	COLOR SEL2
AN05	RING1					NTSC PB SEL0	NTSC PB SEL1
AN06	RING0	TEST	X120 (TEST)		APC		
AN07							
AN08							
AN09	DESTINATION						
AN10							
AN11	AFT						

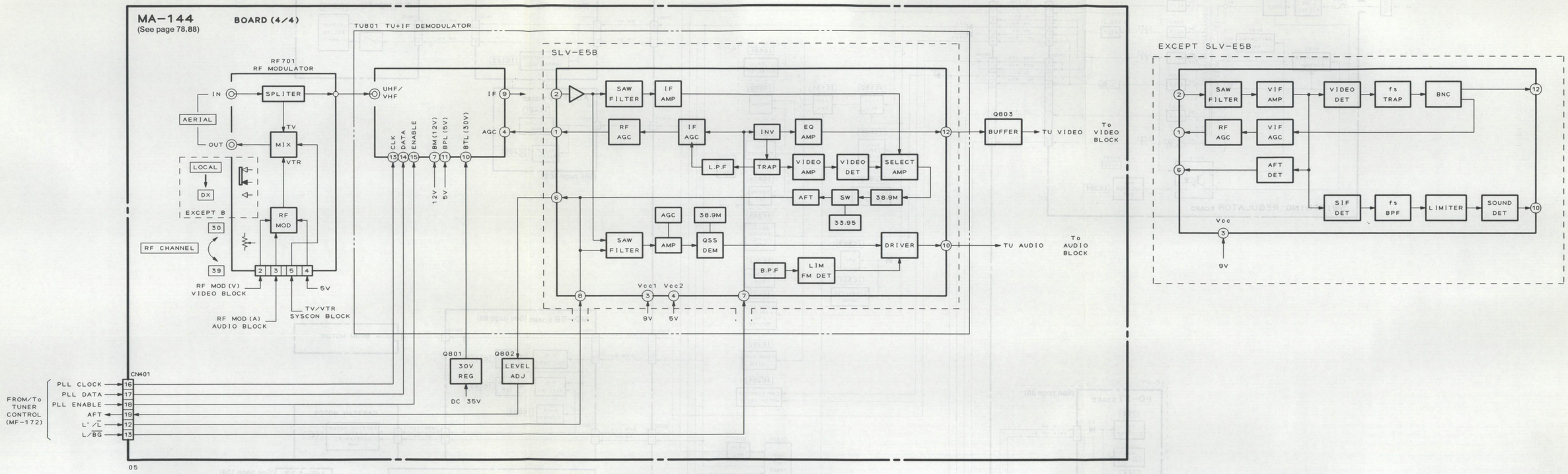
COLOR SELECT SWITCH

SWITCH \ MODE	NTSC	PAL	SECAM	AUTO
COLOR SEL0	on	off		off
COLOR SEL1	off	on		off
COLOR SEL2	off	off		off

NTSC PB SELECT SWITCH

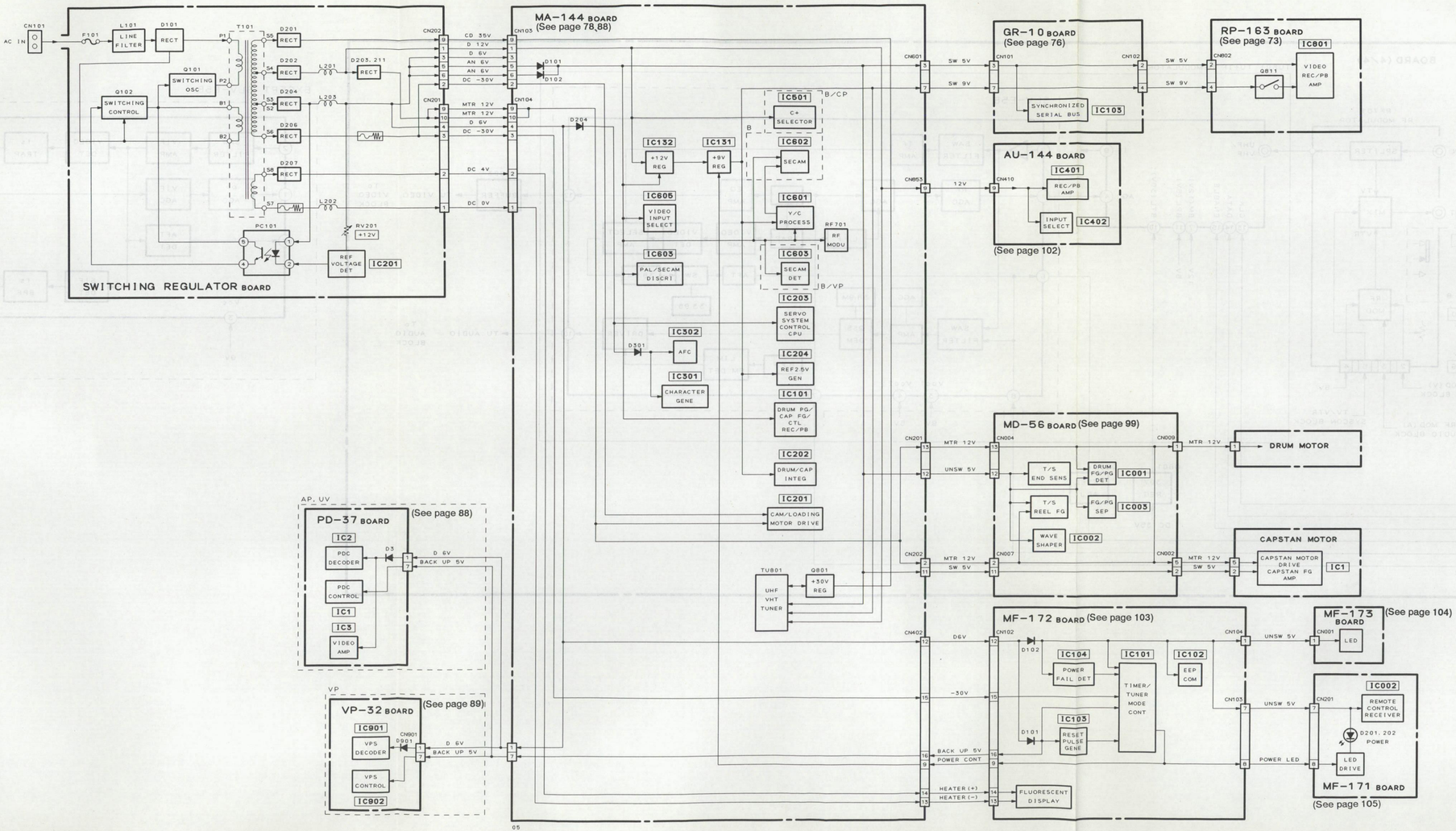
SWITCH \ MODE	ON PAL TV	4.43 NTSC
NTSC PB SEL0	on	off
NTSC PB SEL1	off	on

3-16. TUNER BLOCK DIAGRAM

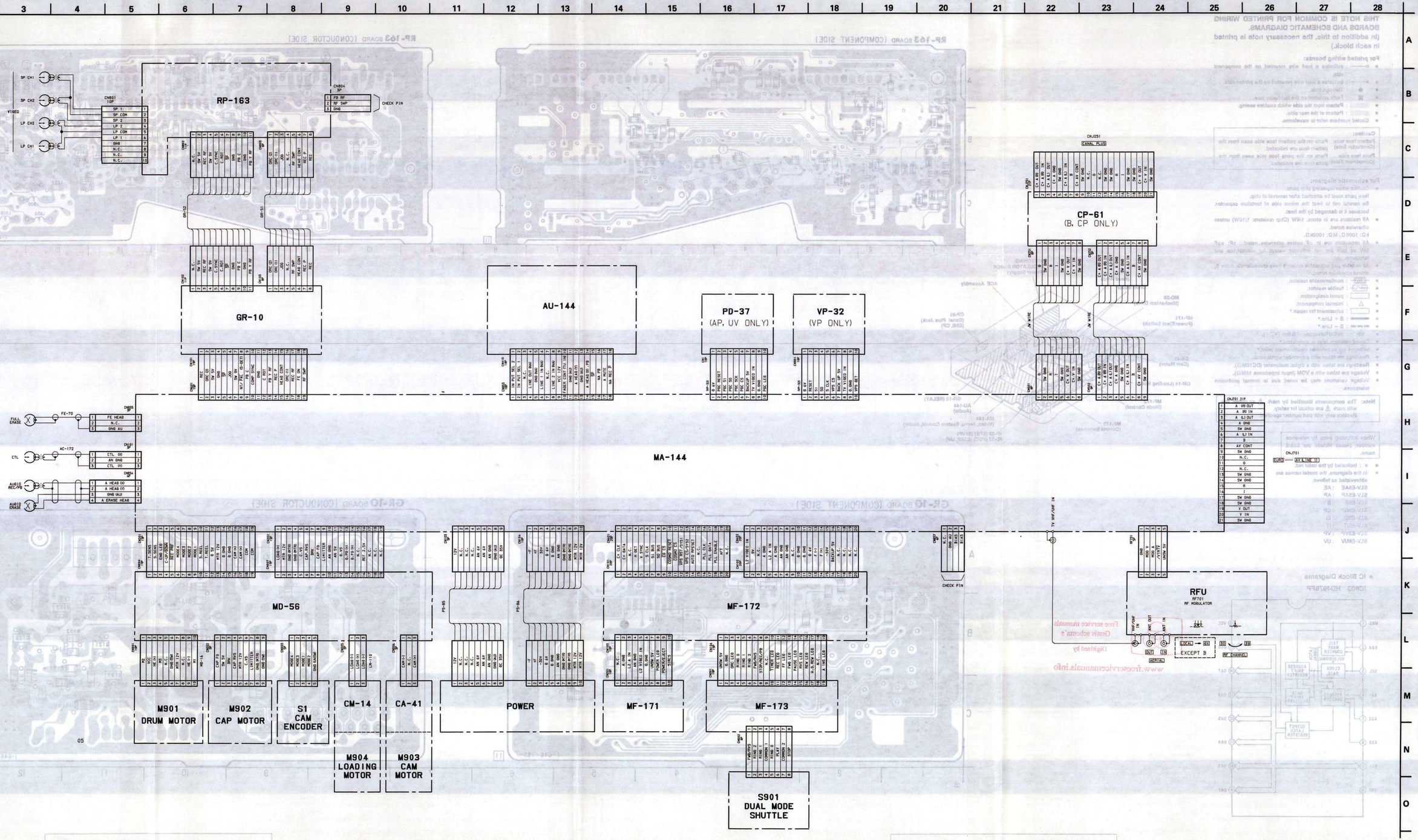


EXCEPT SLV-E5B

3-17. POWER BLOCK DIAGRAM



4-1. FRAME SCHEMATIC DIAGRAM



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards:

- ○——— : indicates a lead wire mounted on the component side.
- ●——— : indicates a lead wire mounted on the printed side.
- ● : Through hole.
- ■ : Parts mounted on the conductor side.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.
- Circled numbers refer to waveforms.

Caution:
Pattern face side: (Conductor Side) Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side) Parts on the parts face side seen from the parts face are indicated.

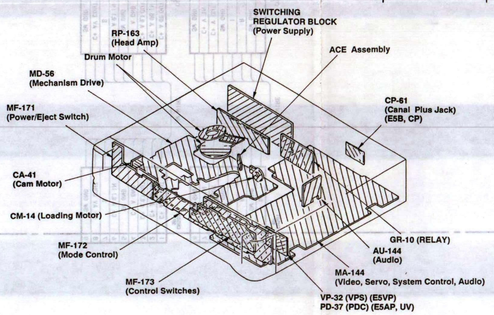
For schematic diagram:

- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W (Chip resistors: 1/10W) unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.*
- ——— : B + Line.*
- – – – : B – Line.*
- ⇨ : IN/OUT direction of B line (+, –).
- Circled numbers refer to waveforms.*
- Voltages are dc between measurement point.*
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage are taken with a VOM (Input impedance 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

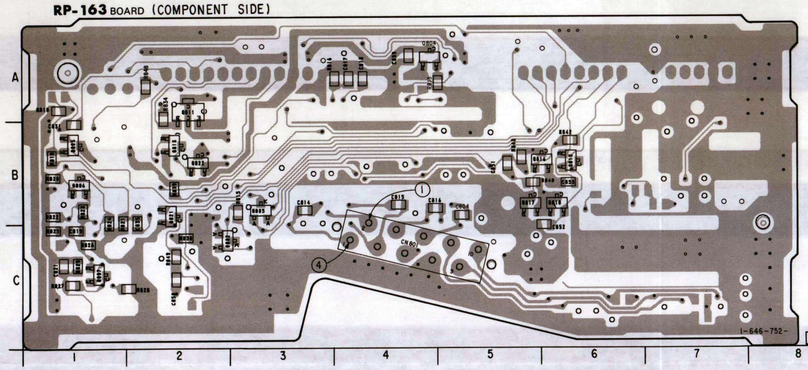
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

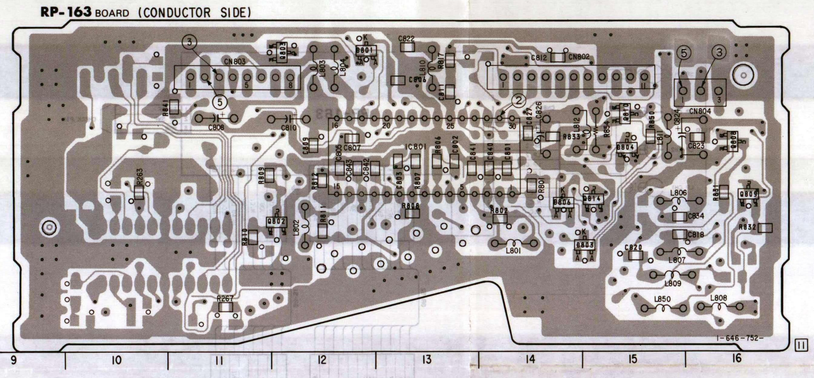
- * : Indicated by the color red.
- In the diagrams, the model names are abbreviated as follows.
  SLV-E5AE : AE
  SLV-E5AP : AP
  SLV-E5B : B
  SLV-E5CP : CP
  SLV-E5EI : EI
  SLV-E5IT : IT
  SLV-E5VP : VP
  SLV-E6UV : UV



RP-163 BOARD (COMPONENT SIDE)



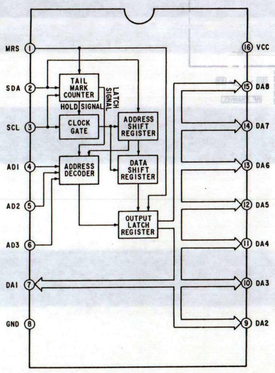
RP-163 BOARD (CONDUCTOR SIDE)



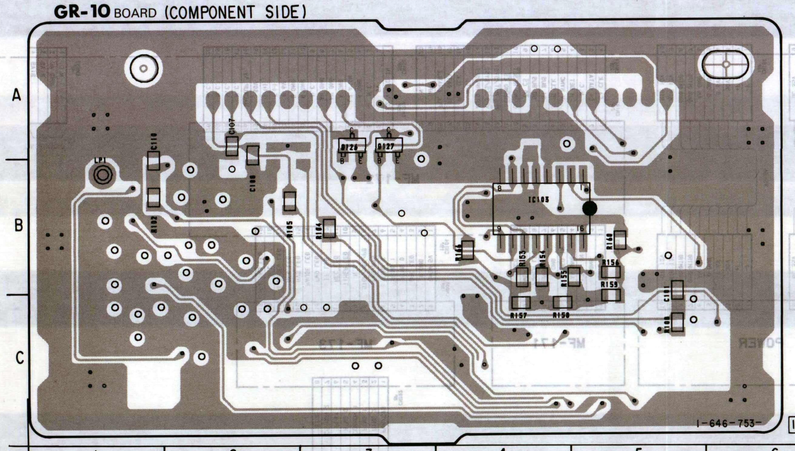
RP-163 BOARD	
CN801	C-4
CN802	A-14
CN803	A-11
CN804	A-16
D801	A-12
D802	C-2
D803	C-15
D804	B-15
D805	B-3
D806	B-14
IC260	C-10
IC803	B-13
Q802	B-12
Q803	A-12
Q804	A-4
Q805	B-1
Q806	B-1
Q807	C-1
Q808	B-16
Q809	B-16
Q810	A-15
Q811	A-2
Q813	B-2
Q814	B-15
Q815	B-6
Q816	B-6
Q817	B-5
Q818	B-6
Q821	B-2
Q822	B-2

- IC Block Diagrams

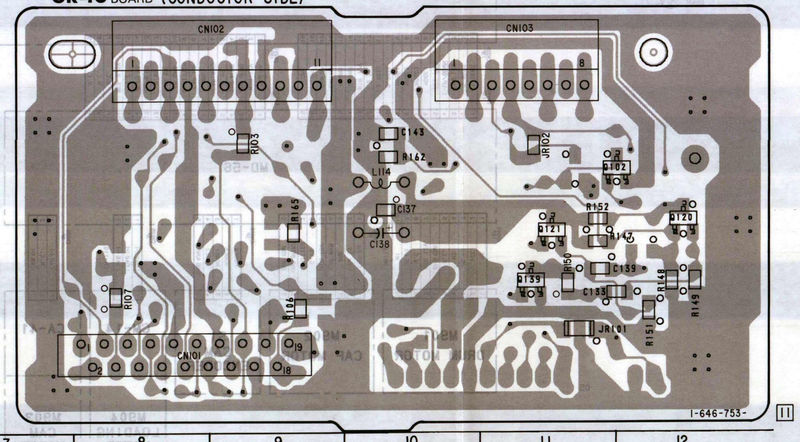
IC803 HD4978FP



GR-10 BOARD (COMPONENT SIDE)



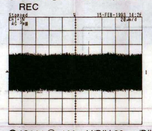
GR-10 BOARD (CONDUCTOR SIDE)



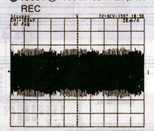
GR-10 BOARD	
CN101	C-8
CN102	A-8
CN103	A-11
IC103	B-4
Q102	B-11
Q120	B-12
Q121	B-11
Q126	A-3
Q127	A-3
Q139	B-11

RP-163 BOARD

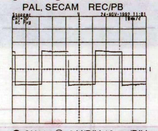
❶ CN801 ② 1 V/DIV 20 μs/DIV REC



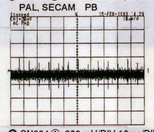
❷ IC801 ⑤ 100 mV/DIV 20 μs/DIV REC



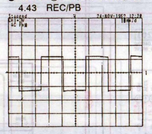
❸ CN804 ② 2 V/DIV 10 ms/DIV PAL, SECAM REC/PB



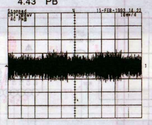
❹ CN801 ① 20 mV/DIV 10 μs/DIV PAL, SECAM PB



❺ CN804 ② 2 V/DIV 10 ms/DIV 4.43 REC/PB



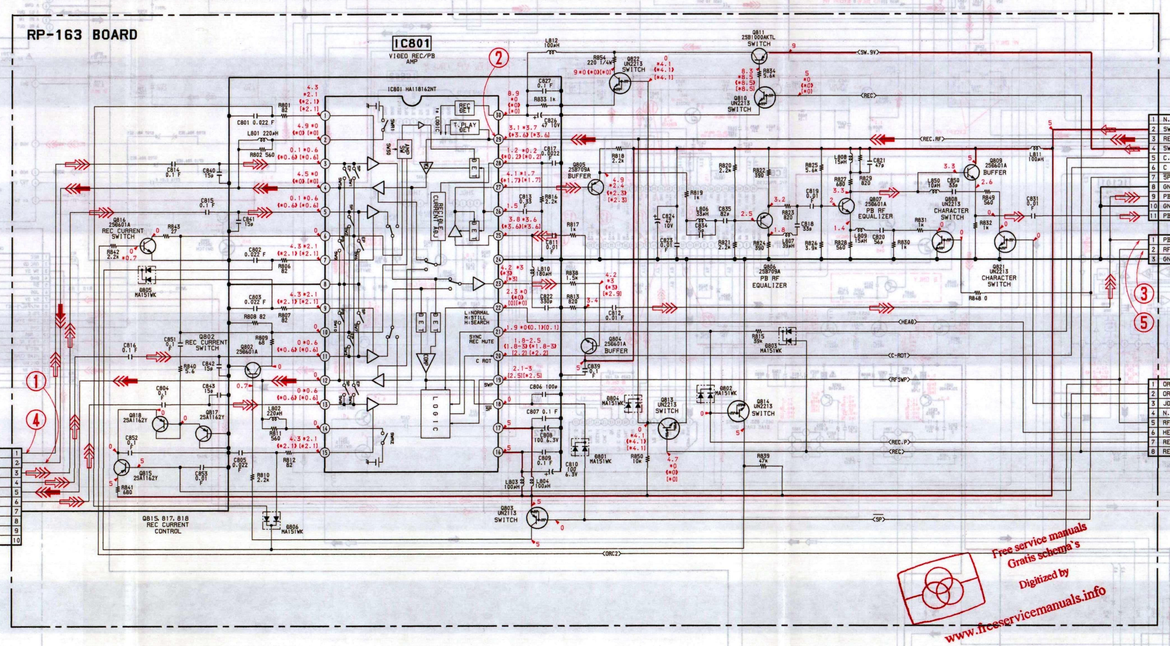
❻ CN804 ① 200 mV/DIV 10ms/DIV 4.43 PB

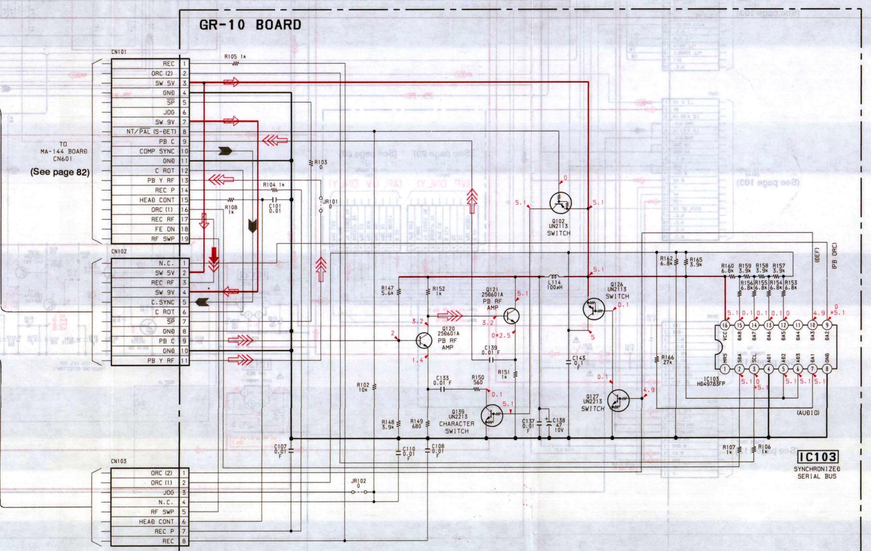


No mark : COMMON (PAL REC)
* : PAL PB
( ) : SECAM REC
(*) : SECAM PB
[ ] : NTSC4.43 REC
[*] : NTSC4.43 PB
: Impossible to measure the voltage at the marked points.

• Signal path

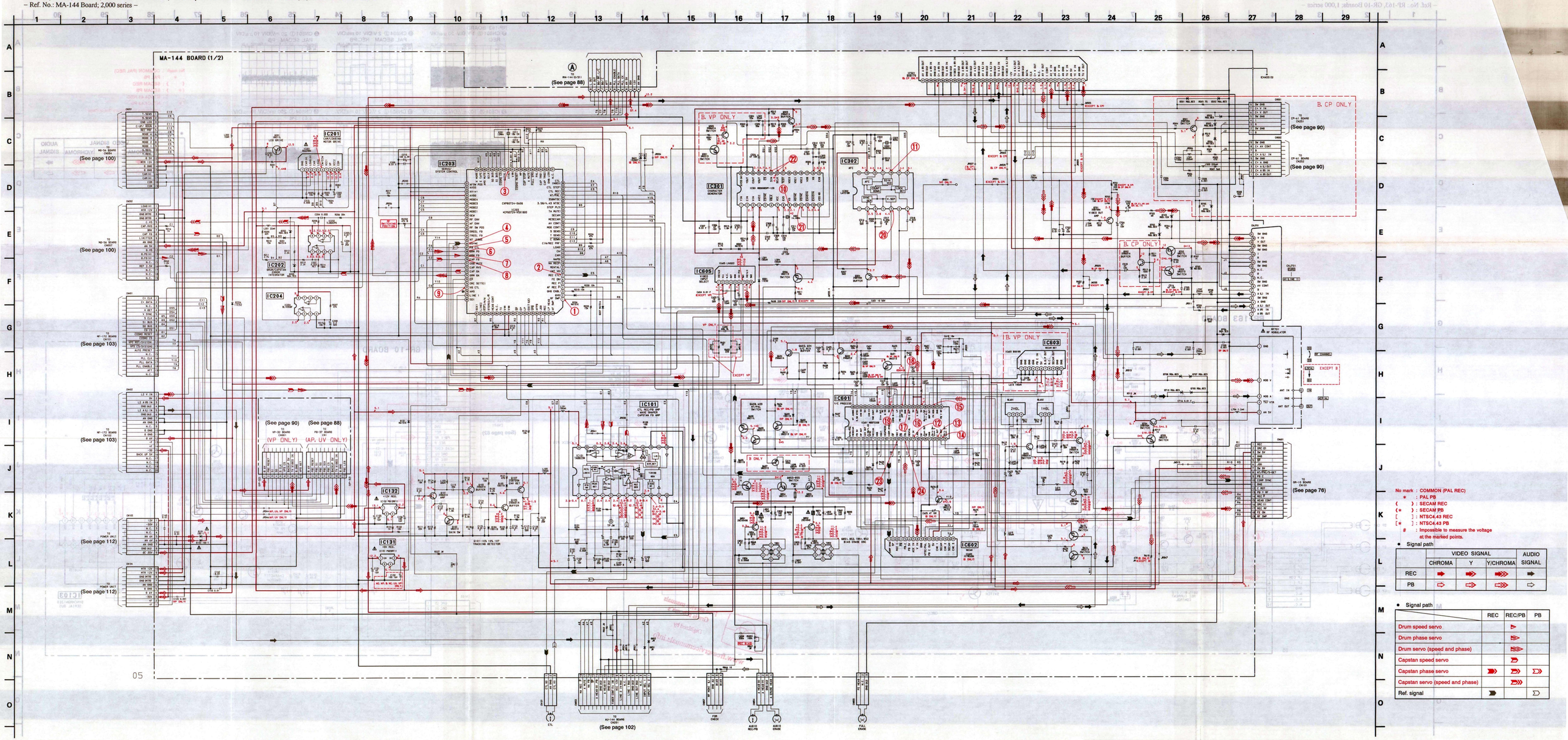
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨





MA-144 (VIDEO, SERVO, SYSTEM CONTROL, AUDIO) SCHEMATIC DIAGRAM • See pages 87, 95 for Waveforms.

– Ref. No.: MA-144 Board; 2,000 series –



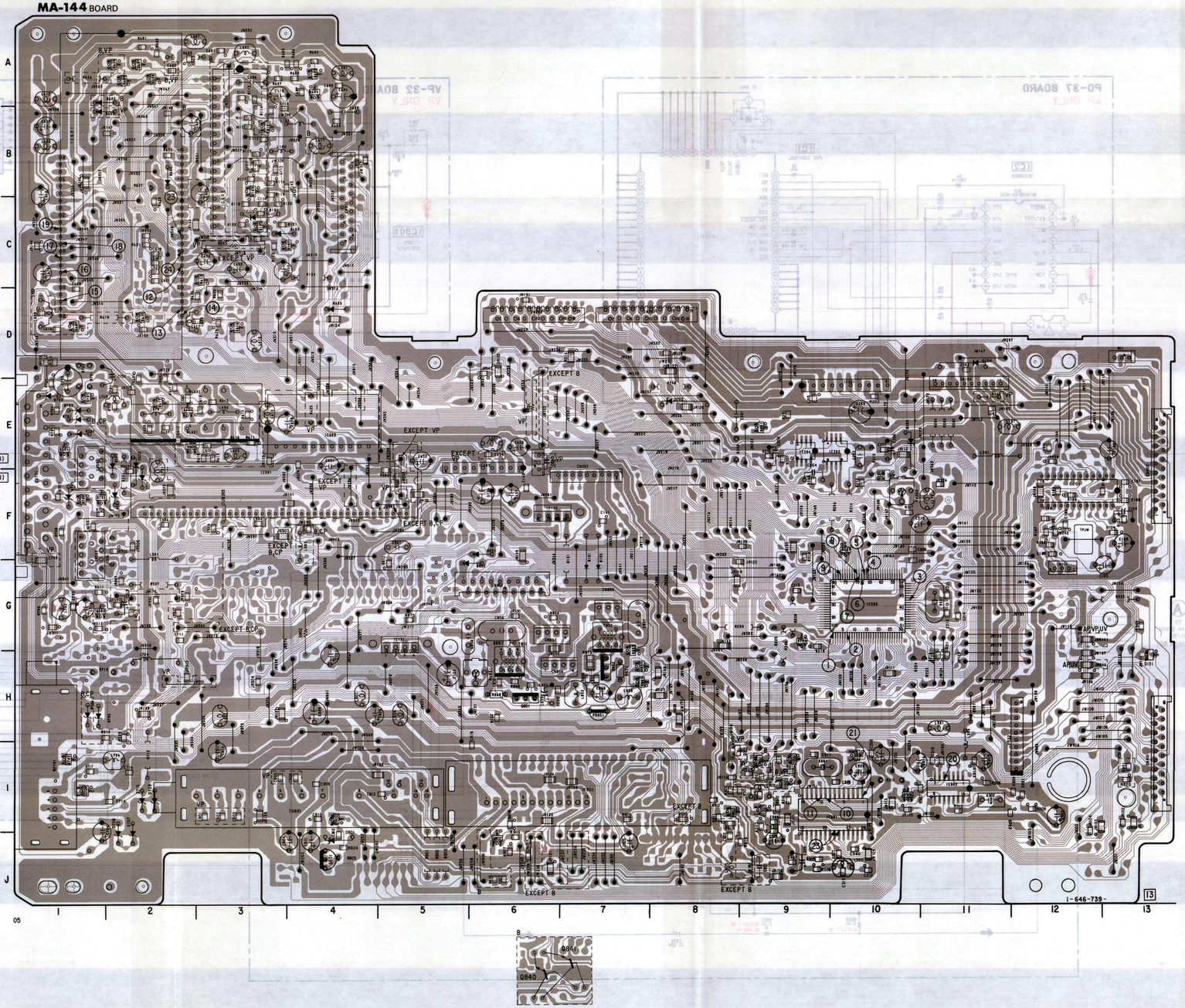
No mark : COMMON (PAL REC)
* : PAL PB
( ) : SECAM REC
(*) : SECAM PB
[ ] : NTSC4.43 REC
[*] : NTSC4.43 PB
: Impossible to measure the voltage at the marked points.

• Signal path

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨

• Signal path

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷	
Drum servo (speed and phase)		▷	
Capstan speed servo		▷	
Capstan phase servo	▷	▷	▷
Capstan servo (speed and phase)		▷	
Ref. signal	▶		▷



MA-144 (VIDEO, SERVO, SYSTEM CONTROL, AUDIO) PRINTED WIRING BOARD

– Ref. No.: MA-144 Board; 2,000 series –

MA-144 BOARD

CN032		IC302	I-11
CN101	G-12	IC501	F-3
CN103	F-7	IC601	A-1
CN104	E-14	IC602	B-3
CN201	D-7	IC603	E-4
CN202	D-6	IC605	E-6
CN401	H-13		
CN402	E-13	Q101	B-3
CN501	E-1	Q102	B-3
CN502	F-1	Q103	B-3
CN601	B-4	Q105	C-3
CN853	G-6	Q107	C-3
CN854	H-6	Q201	E-9
CN855	G-7	Q301	I-8
CN857	G-6	Q303	I-9
		Q304	I-10
D101	G-7	Q305	I-9
D102	G-7	Q306	I-10
D103	C-3	Q501	E-1
D104	C-3	Q502	G-1
D131	H-13	Q503	G-1
D201	F-10	Q601	A-2
D202	E-8	Q602	A-4
D203	E-10	Q603	A-3
D204	D-11	Q604	A-4
D206	G-9	Q605	E-2
D207	F-10	Q606	E-2
D301	H-11	Q607	D-1
D302	I-9	Q608	A-2
D501	F-2	Q609	A-2
D502	E-2	Q613	C-3
D503	F-2	Q614	A-2
D505	E-2	Q615	D-2
D506	H-1	Q616	D-3
D601	I-9	Q617	E-2
D602	A-1	Q701	E-1
D603	B-1	Q702	F-1
D604	B-2	Q703	F-1
D605	D-4	Q704	I-1
D701	E-1	Q705	I-1
D702	E-1	Q801	J-4
D703	E-1	Q803	I-8
D704	E-1	Q851	H-6
D705	F-1	Q852	H-7
D706	H-1	Q853	H-7
D707	I-2	Q854	H-7
D708	I-2	Q855	H-7
D709	I-2	Q856	G-5
D710	I-2		
D801	J-4		
D802	I-4		
D851	F-6		
D852	G-5		
D853	G-5		
D854	G-5		
IC101	F-12		
IC131	G-5		
IC132	F-6		
IC201	E-9		
IC202	E-10		
IC203	G-10		
IC204	E-9		
IC301	I-9		

IC203 VOLTAGE VALUES

Color system	Pin No.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰
PAL	REC	2.1-3	0	0	5.1	0	5	2.6-3.4		0	5.1	0	0	5.1	0	5.1	0	0
	PB	2.1-3	0	0	0	0	0	2.6		0	0	5.1	0	0	0	5.1	0	0
SECAM	REC	2.1-3	0	0	5.1	0	5	2.6-3.4		0	5.1	0	0	5.1	0	5.1	0	0
	PB	2.1-3	0	0	0	0	0	2.6		0	0	5.1	0	0	0	5.1	0	0
NTSC 4.43	REC	2.1-3	0	0	5.1	0	5	2.6-3.4		0	5.1	0	0	5.1	0	5.1	0	0
	PB	2.1-3	0	0	0	0	0	2.6		0	0	5.1	0	0	0	5.1	0	0

Color system	Pin No.	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉗	㉘	㉙	㉚	㉛	㉜	㉝	㉞
PAL	REC	0	5	5	0.5	0	0	0	0	0	0	5.1	0	0		7.3-7.9	0	0
	PB	0	5	5	0.7	0	0	0	0	0	0	0	0	0		7.2-7.6	0.5	0.5
SECAM	REC	0	5	5.1	4	0.4	0	0	0	0	0	5.1	0	0		7.4-7.8	0.5	0.5
	PB	0	5	5	4	0	0	0	0	0	0	0	0	0		7.2-7.6	0.5	0.5
NTSC 4.43	REC	0	5	5.1	0.6	0	0	0	0	0	0	5.1	0	0		7.5-8	0.5	0.5
	PB	0	5	5.1	0.7	0	0	0	0	0	0	0	0	0		7.1-6	0.5	0.5

Color system	Pin No.	㉟	㊱	㊲	㊳	㊴	㊵	㊶	㊷	㊸	㊹	㊺	㊻	㊼	㊽	㊾	㊿	(51)
PAL	REC	0	0	0.2	2.3	GND	5.1	0	2.4	2.4	5	4.7	2.1	3.2		5		2.2
	PB	5.2	12.1	0.2	2.3	GND	5.1	0	2.4	2.4	5	3.6	1.4	3.8		0		2.2
SECAM	REC	5.1	0	0.2	2.3	GND	5.1	0	2.4	2.4	5	4.7	1.4	4.7		0		2.2
	PB	4.4	12.1	0.2	2.3	GND	5.1	0	2.4	2.4	5	4.7	1.4	4.9		0		2.2
NTSC 4.43	REC	5.1	0	0.2	2.3	GND	5.1	0	2.4	2.4	5	4.7	1.4	4.7		0		2.2
	PB	5.2	12.1	0.2	2.3	GND	5.1	0	2.4	2.4	5	4.7	1.4	4.0		0		2.2

Color system	Pin No.	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)	(62)	(63)	(64)	(65)	(66)	(67)	(68)
PAL	REC	GND	5.2	5.2	0	5.2	0	5.2	0	0	0.8	2.5	#	#	0.2	0.4	2.6-3.4	0.1
	PB	GND	5.2	5.2	0	5.2	0	5.2	0	3.7	3.9	2.5	#	#	0.2	0.4	2.6-3.4	0.1
SECAM	REC	GND	5.2	5.2	0	5.2	0	5.2	0	0	0.8	2.5	#	#	0.2	0.4	2.6-3.4	0.3
	PB	GND	5.2	5.2	0	5.2	0	5.2	0	3.1	3.1	2.5	#	#	0.2	0.4	2.6-3.4	0.3
NTSC 4.43	REC	GND	5.2	5.2	0	5.2	0	5.2	0	0	0.8	2.5	#	#	0.2	0.4	2.6-3.4	0.4
	PB	GND	5.2	5.2	0	5.2	0	5.2	0	3.1	3.8	2.5	#	#	0.2	0.4	2.6-3.4	0.2

Color system	Pin No.	(69)	(70)	(71)	(72)	(73)	(74)	(75)	(76)	(77)	(78)	(79)	(80)	(81)	(82)	(83)	(84)	(85)
PAL	REC	3.4	2.6	0	0	2.5	2.5	5.1	0	2.6-3.4		0	5	5.1	0	0	5.1	2.4
	PB	3.4	2.6	0	0	2.5	2.5	5.1	0	2.6-3.4		0	5	5.1	0	0	5.1	0
SECAM	REC	3.4	2.6	0	0	2.5	2.5	5.1	0	2.6-3.4		5.1	5	5.1	0	0	5.1	2.4
	PB	3.4	2.6	0	0	2.5	2.5	5.1	0	2.6-3.4		5.1	5	5.1	0	0	5.1	0
NTSC 4.43	REC	3.4	2.6	0	0	2.5	2.5	5.1	0	2.6-3.4		5.1	5	5.1	0	0	5.1	2.4
	PB	3.4	2.6	0	0	2.5	2.5	5.1	0	2.6-3.4		5.1	5	5.1	0	0	5.1	0

Color system	Pin No.	(86)	(87)	(88)	(89)	(90)	(91)	(92)	(93)	(94)	(95)	(96)	(97)	(98)	(99)	(100)
PAL	REC			GND	5.2		0	0	0	0	5.1	0	0	5.1	0	2.1-3
	PB			GND	5.2		0	0	0	0	0.1	5.1	0	0	0	2.1-3
SECAM	REC			GND	5.2		0	0	0	0	5.1	0	0	5.1	0	2.1-3
	PB			GND	5.2		0	0	0	0	0.1	5.1	0	0	0	2.1-3
NTSC 4.43	REC			GND	5.2		0	0	0	0	5.1	0	0	5.1	0	2.1-3
	PB			GND	5.2		0	0	0	0	0.1	5.1	0	0	0	2.1-3

IC601 VOLTAGE VALUES

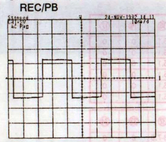
Color system	Pin No.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰
PAL	REC	0.2	0.4	0	4.9	1.9	0	0	GND	0	2.6	0.5	0	1.3	5.1	0	0	3.2
	PB	5	0.1	4.8	4.9	1.9	0	4.1	GND	0	2.6	0.5	0	1.3	0.1	0	0	3.2
SECAM	REC	0.2	0.5	0	4.9	3	0	0	GND	0	2.6	0.5	0	1.3	5.1	0	0	3.2
	PB	5	0	4.8	4.9	1.9	0	4.1	GND	0	2.6	0.5	0	1.3	0.1	0	0	3.2
NTSC 4.43	REC	0.2	0.1	0	4.9	1.9	0	0	GND	0	2.6	0.5	0	1.3	5.1	0	0	3.2
	PB	0.2	0	4.8	4.9	1.9	0	4.1	GND	0	2.6	0.5	0	1.3	0.1	0	0	3.2

Color system	Pin No.	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉗	㉘	㉙	㉚	㉛	㉜	㉝	㉞
PAL	REC	0	8.9		GND	2.4	3.6	1.8-2.6	1.8	0	GND	3	0.5	2.2	4.9	2	4.9	1.2
	PB	0	8.9		GND	2.1	3.3	2.1	2.7	0	GND	3.5	0.5	2.2	4.9	2	4.9	1.2
SECAM	REC	0	8.9		GND	2.4	3.6	1.8-2.6	1.8	0	GND	3	0.5	2.2	4.9	2	4.9	1.2
	PB	0	8.9		GND	2.4	3.6	2.4	2.8	0	GND	3.6	0.5	2.2	4.9	2	4.9	1.2
NTSC 4.43	REC	0	8.9		GND	2.4	3.6	1.8-2.6	1.8	0	GND	3	0.5	2.2	4.9	2	4.9	1.2
	PB	0	8.9		GND	2	3.1	1.8-2.6	2.8	0	GND	3.6	0.5	2.2	4.9	2	4.9	1.2

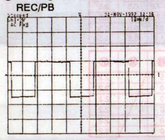
Color system	Pin No.	㉟	㊱	㊲	㊳	㊴	㊵	㊶	㊷	㊸	㊹	㊺	㊻	㊼	㊽
PAL	REC	GND	1.9	0	0	4.8	0		5			0		0	0
	PB	GND	1.9	0	0	4.8	0		5			0		0	0
SECAM	REC	GND	1.9	0	0	4.8	0		5			0		0	0
	PB	GND	1.9	0	0	4.8	0		5			0		0	0
NTSC 4.43	REC	GND	2	0	0	4.8	0		5			0		0	0
	PB	GND	2	0	0	4.8	0		5			0		0	0

MA-144 BOARD (1/2) • See pages 95 and 78 for warveforms (2/2).

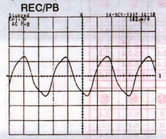
❶ IC203 ① 2 V/DIV 10 ms/DIV REC/PB



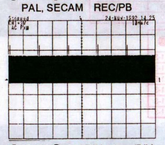
❷ IC203 ⑦ 2 V/DIV 10 ms/DIV REC/PB



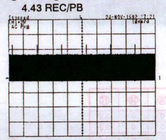
❸ IC203 ⑭ 2 V/DIV 500 μs/DIV REC/PB



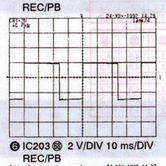
❹ IC203 ⑱ 2 V/DIV 10 ms/DIV PAL, SECAM REC/PB



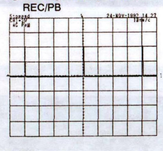
❹ IC203 ⑱ 2 V/DIV 10 ms/DIV 4.43 REC/PB



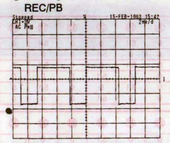
❺ IC203 ⑲ 2 V/DIV 10 ms/DIV REC/PB



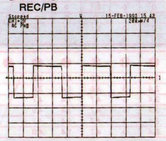
❻ IC203 ⑱ 2 V/DIV 10 ms/DIV REC/PB



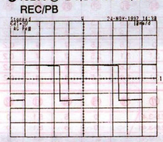
❼ IC203 ⑧ 2 V/DIV 1 ms/DIV REC/PB



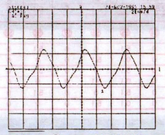
❽ IC203 ⑯ 2 V/DIV 200 μs/DIV REC/PB



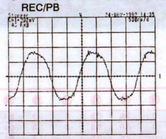
❾ IC203 ⑰ 2 V/DIV 10 ms/DIV REC/PB



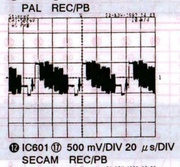
❿ IC301 ⑨ 2 V/DIV 20 ns/DIV



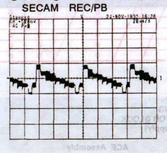
⓫ IC302 ⑮ 200 mV/DIV 500 ns/DIV REC/PB



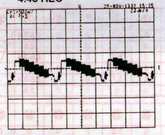
⓬ IC601 ⑰ 500 mV/DIV 20 μs/DIV PAL REC/PB



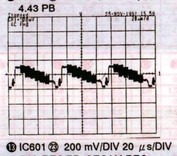
⓬ IC601 ⑰ 500 mV/DIV 20 μs/DIV SECAM REC/PB



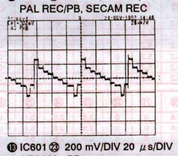
⓬ IC601 ⑰ 500 mV/DIV 20 μs/DIV 4.43 REC



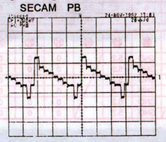
⓬ IC601 ⑰ 500 mV/DIV 20 μs/DIV 4.43 PB



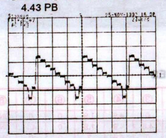
⓭ IC601 ㉒ 200 mV/DIV 20 μs/DIV PAL REC/PB, SECAM REC



⓭ IC601 ㉒ 200 mV/DIV 20 μs/DIV SECAM PB



⓭ IC601 ㉒ 200 mV/DIV 20 μs/DIV 4.43 PB



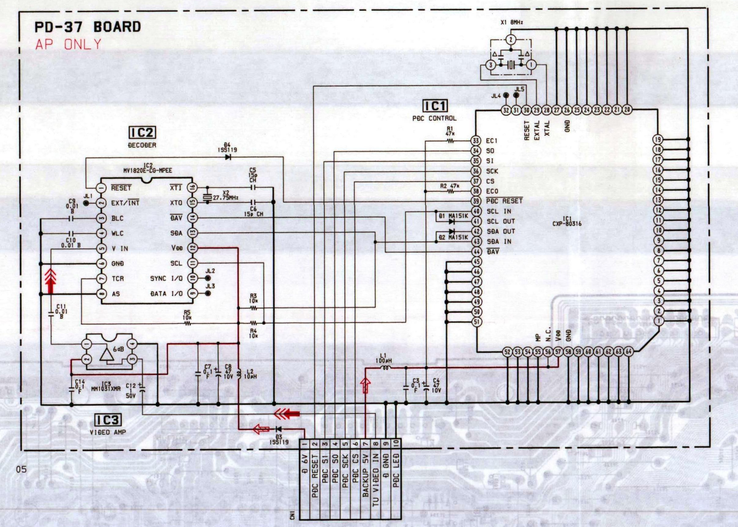
Continued on page 95.

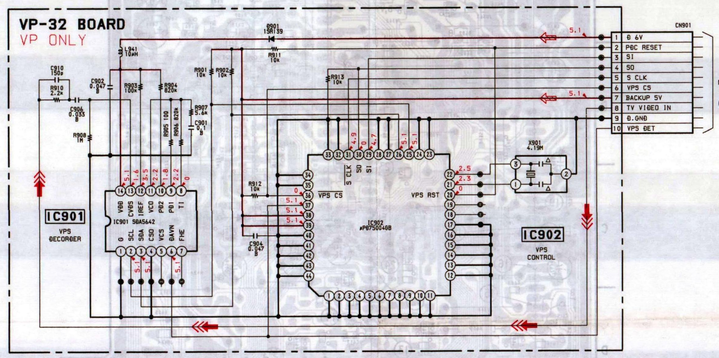
No mark : COMMON (PAL REC)
* : PAL PB
( ) : SECAM REC
(*) : SECAM PB
[ ] : NTSC4.43 REC
[*] : NTSC4.43 PB
: Impossible to measure the voltage at the marked points.

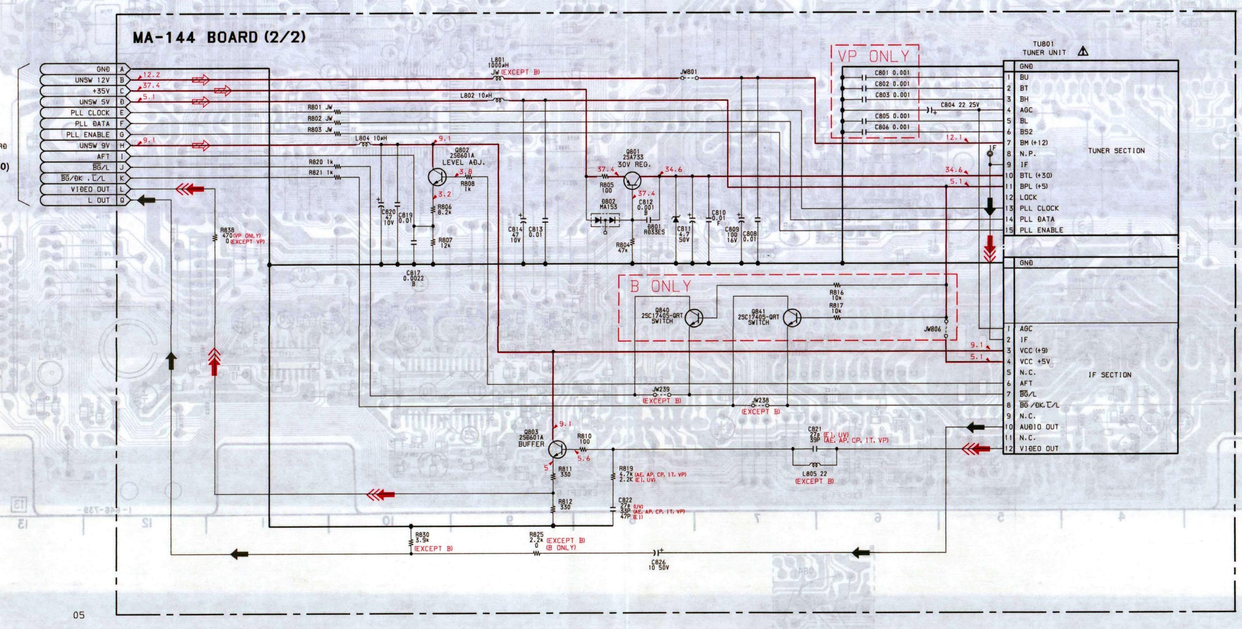
• Signal path

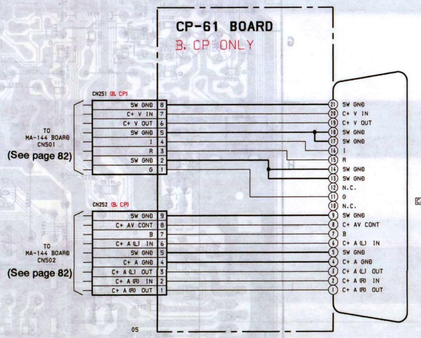
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨

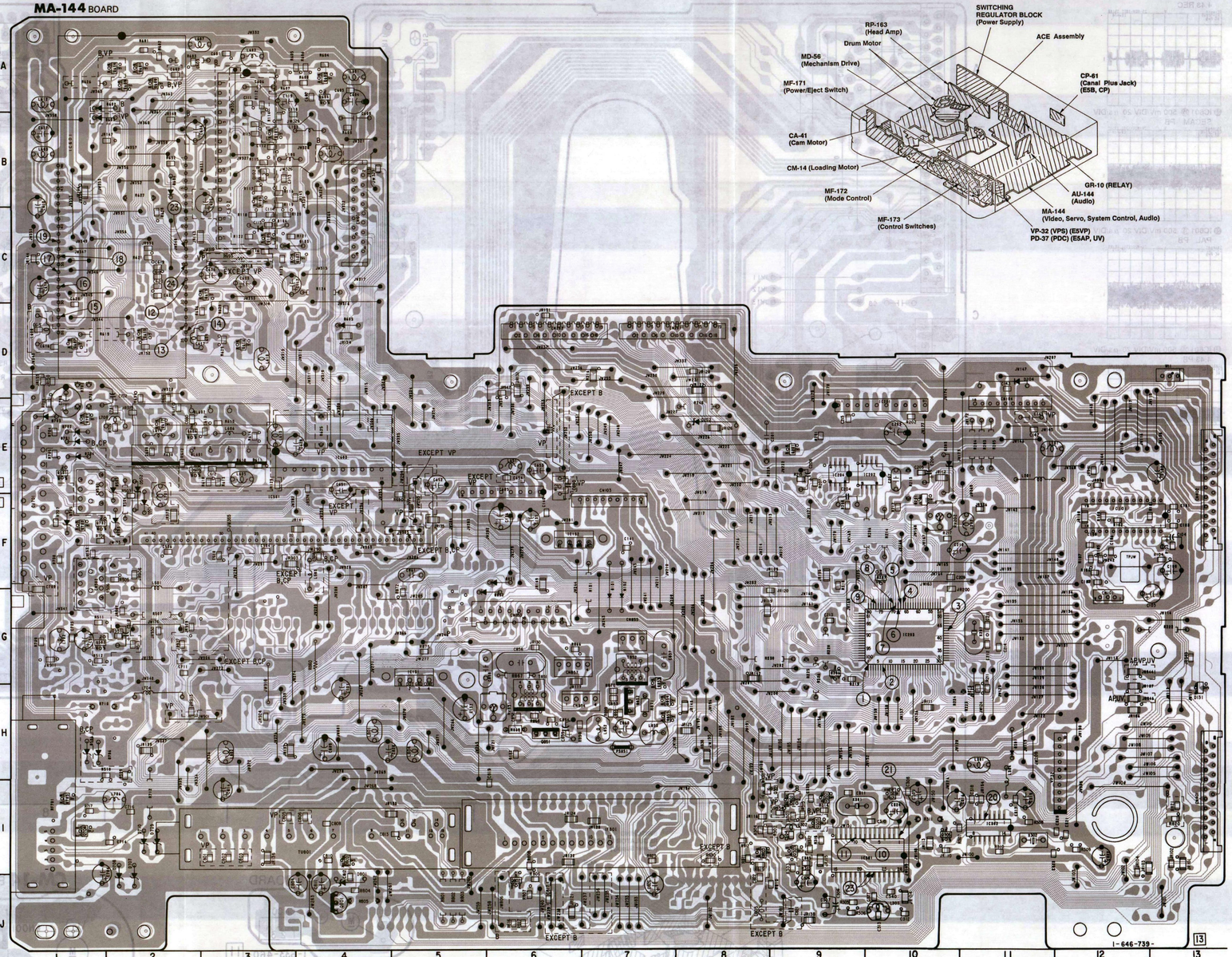
MA-144 (AUDIO) , CP-61 (CANAL PLUS JACK), PD-37 (PDC), VP-32 (VPS) SCHEMATIC DIAGRAM
– Ref. No.: MA-144, CP-61, PD-37, VP-32 Boards; 2,000 series –











MA-144 (TUNER), CP-61(CANAL PLUS JACK), PD-37 (PDC), VP-32 (VPS) PRINTED WIRING BOARDS

– Ref. No.: MA-144, CP-61, PD-37, VP-32 Boards; 2,000 series –

MA-144 BOARD

CN032		IC302	I-11
CN101	G-12	IC501	F-3
CN103	F-7	IC601	A-1
CN104	E-14	IC602	B-3
CN201	D-7	IC603	E-4
CN202	D-6	IC605	E-6
CN401	H-13		
CN402	E-13	Q101	B-3
CN501	E-1	Q102	B-3
CN502	F-1	Q103	B-3
CN601	B-4	Q105	C-3
CN853	G-6	Q107	C-3
CN854	H-6	Q201	E-9
CN855	G-7	Q301	I-8
CN857	G-6	Q303	I-9
		Q304	I-10
D101	G-7	Q305	I-9
D102	G-7	Q306	I-10
D103	C-3	Q501	E-1
D104	C-3	Q502	G-1
D131	H-13	Q503	G-1
D201	F-10	Q601	A-2
D202	E-8	Q602	A-4
D203	E-10	Q603	A-3
D204	D-11	Q604	A-4
D206	G-9	Q605	E-2
D207	F-10	Q606	E-2
D301	H-11	Q607	D-1
D302	I-9	Q608	A-2
D501	F-2	Q609	A-2
D502	E-2	Q613	C-3
D503	F-2	Q614	A-2
D505	E-2	Q615	D-2
D506	H-1	Q616	D-3
D601	I-9	Q617	E-2
D602	A-1	Q701	E-1
D603	B-1	Q702	F-1
D604	B-2	Q703	F-1
D605	D-4	Q704	I-1
D701	E-1	Q705	I-1
D702	E-1	Q801	J-4
D703	E-1	Q803	I-8
D704	E-1	Q851	H-6
D705	F-1	Q852	H-7
D706	H-1	Q853	H-7
D707	I-2	Q854	H-7
D708	I-2	Q855	H-7
D709	I-2	Q856	G-5
D710	I-2		
D801	J-4		
D802	I-4		
D851	F-6		
D852	G-5		
D853	G-5		
D854	G-5		
IC101	F-12		
IC131	G-5		
IC132	F-6		
IC201	E-9		
IC202	E-10		
IC203	G-10		
IC204	E-9		
IC301	I-9		

MA-144 BOARD

CP-61 BOARD

05

CANAL PLUS

CANAL +

PD-37 BOARD

05

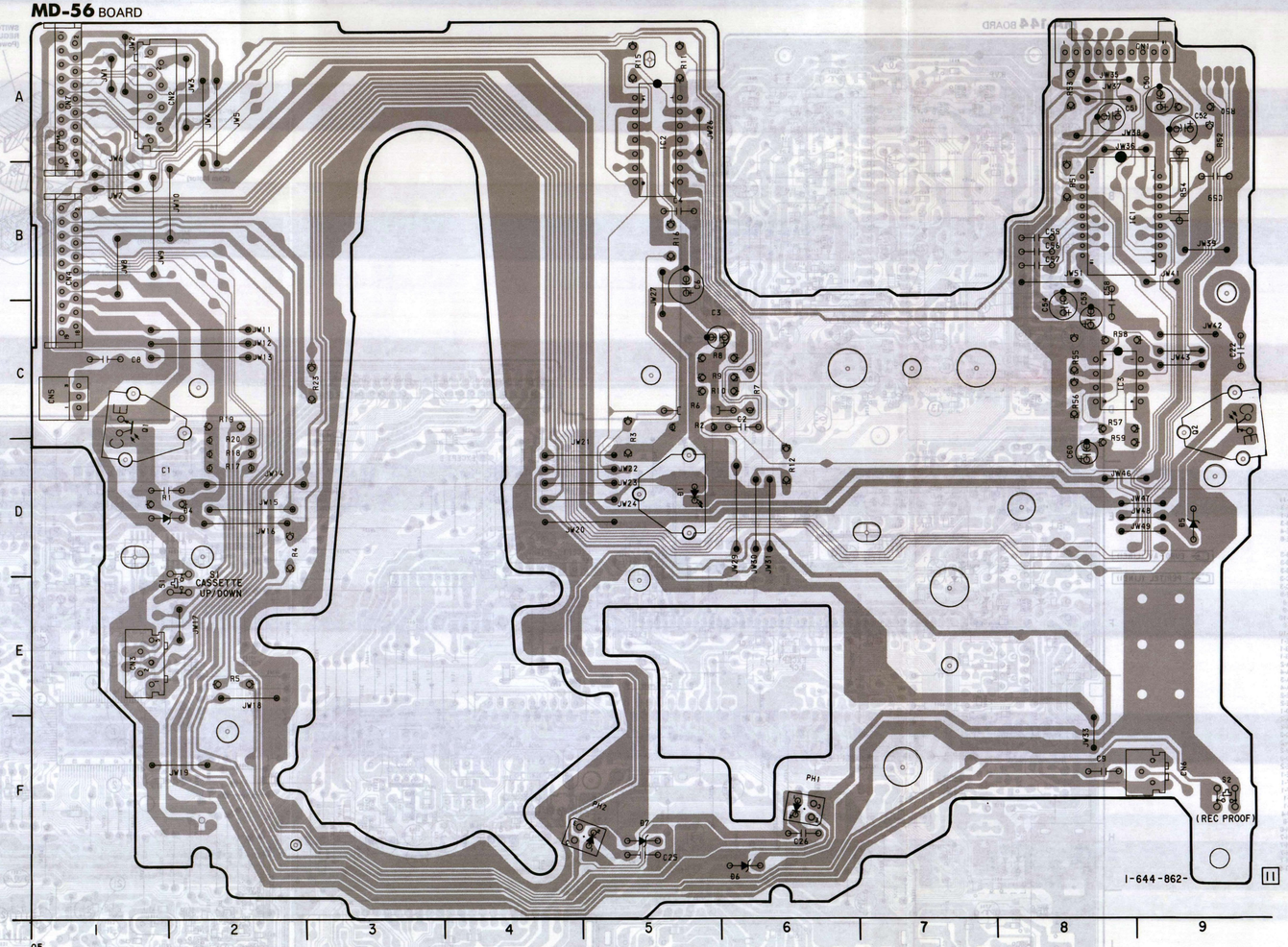
VP-32 BOARD

• Continued from page 87.

MA-144 BOARD (2/2)

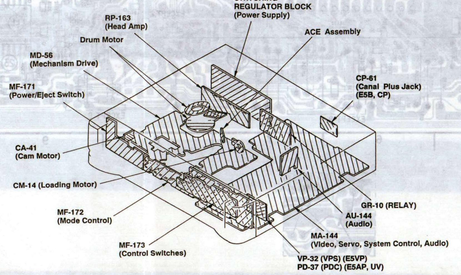
⑩ IC601 ㉑ 200 mV/DIV 20 μs/DIV 4.43 REC
⑪ IC601 ㉒ 1 V/DIV 20 μs/DIV 4.43 PB
⑫ IC601 ㉓ 50 mV/DIV 50 μs/DIV SECAM REC
⑬ IC601 ㉔ 500 mV/DIV 20 μs/DIV 4.43 PB
⑭ IC601 ㉕ 100 mV/DIV 20 μs/DIV 4.43 REC
⑮ IC601 ㉖ 2 V/DIV 10 ms/DIV PAL SECAM REC/PB
⑯ IC601 ㉗ 100 mV/DIV 20 μs/DIV PAL REC
⑰ IC601 ㉘ 50 mV/DIV 50 μs/DIV SECAM PB
⑱ IC302 ⑤ 2 V/DIV 5 ms/DIV PAL SECAM REC/PB
⑲ IC601 ㉙ 500 mV/DIV 20 μs/DIV SECAM PB
⑳ IC601 ㉚ 2 V/DIV 10 ms/DIV 4.43 REC/PB
㉑ IC601 ㉛ 200 mV/DIV 20 μs/DIV PAL PB
㉒ IC601 ㉜ 200 mV/DIV 20 μs/DIV 4.43 REC
㉓ IC302 ⑤ 2 V/DIV 5 ms/DIV 4.43 REC/PB
㉔ IC601 ㉝ 500 mV/DIV 20 μs/DIV PAL PB
㉕ IC601 ㉞ 500 mV/DIV 200 ns/DIV REC
㉖ IC601 ㉟ 100 mV/DIV 50 μs/DIV SECAM REC
㉗ IC601 ㊱ 100 mV/DIV 20 μs/DIV 4.43 PB
㉘ IC301 ① 2 V/DIV 10 ms/DIV PAL, SECAM REC/PB
㉙ IC601 ㊲ 500 mV/DIV 20 μs/DIV 4.43 PB
㉚ IC601 ㊳ 1 V/DIV 20 μs/DIV PAL REC
㉛ IC601 ㊴ 200 mV/DIV 50 μs/DIV SECAM PB
㉜ IC601 ㊵ 500 mV/DIV 20 μs/DIV PAL REC
㉝ IC301 ① 2 V/DIV 10 ms/DIV 4.43 REC/PB
㉞ IC601 ㊶ 1 V/DIV 20 μs/DIV PAL PB
㉟ IC601 ㊷ 200 mV/DIV 20 μs/DIV 4.43 REC
㊱ IC601 ㊸ 1 V/DIV 20 μs/DIV PAL PB
㊲ IC301 ㉒, ㉓ 2 V/DIV 10 ms/DIV PAL, SECAM REC/PB
㊳ IC601 ㊹ 1 V/DIV 20 μs/DIV SECAM REC
㊴ IC601 ㊺ 200 mV/DIV 20 μs/DIV 4.43 PB
㊵ IC601 ㊻ 500 mV/DIV 50 μs/DIV SECAM REC
㊶ IC301 ㉒, ㉓ 2 V/DIV 10 ms/DIV 4.43 REC/PB
㊷ IC601 ㊼ 1 V/DIV 20 μs/DIV SECAM PB
㊸ IC601 ㊽ 50 mV/DIV 20 μs/DIV PAL REC
㊹ IC601 ㊾ 500 mV/DIV 50 μs/DIV SECAM PB
㊺ IC601 ㊿ 100 mV/DIV 20 μs/DIV PAL REC
㊻ IC601 (51) 1 V/DIV 20 μs/DIV 4.43 REC
㊼ IC601 (52) 100 mV/DIV 20 μs/DIV PAL PB
㊽ IC601 (53) 500 mV/DIV 50 μs/DIV 4.43 REC
㊾ IC601 (54) 100 mV/DIV 50 μs/DIV SECAM REC

MD-56 BOARD

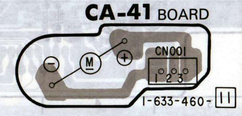


MD-56 BOARD

CN001	A-8
CN002	A-1
CN003	E-1
CN004	B-1
CN005	C-1
CN006	F-9
CN007	A-1
D1	D-5
D4	D-2
D5	D-3
D6	G-6
D7	F-5
IC1	B-8
IC2	A-5
IC3	C-8
PH1	F-4
PH2	F-8
Q1	C-1
Q2	C-9

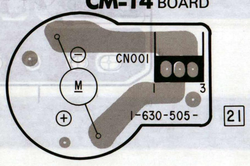


CA-41 BOARD



M903
CAM MOTOR

CM-14 BOARD



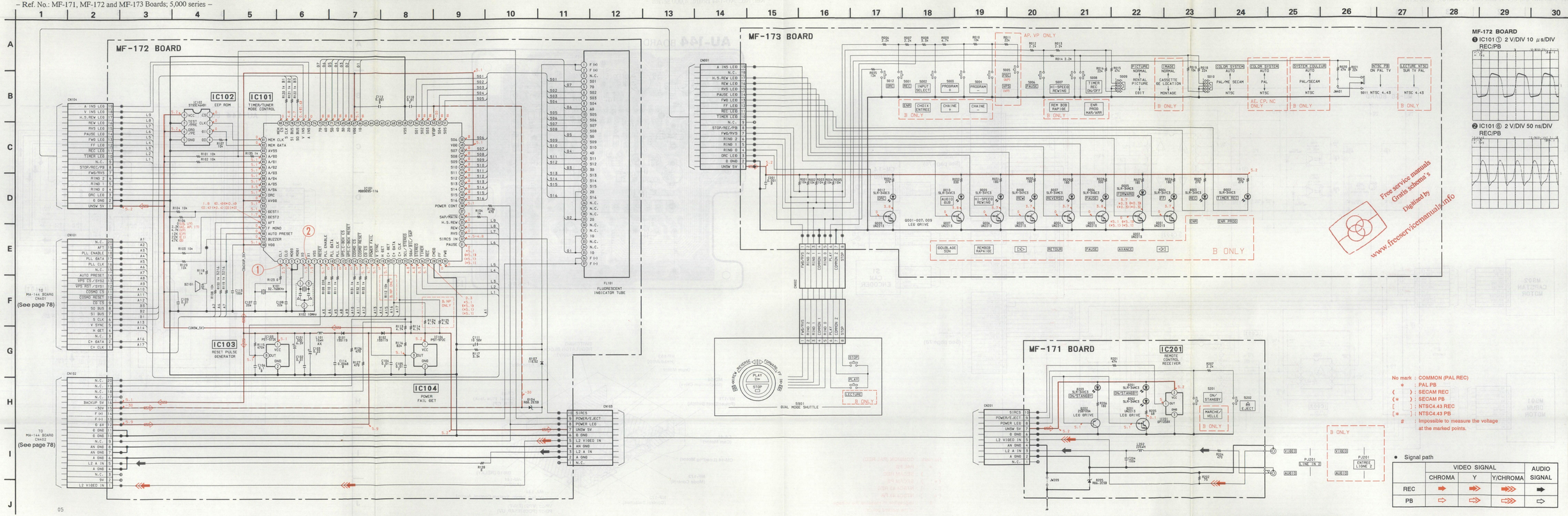
M904
LOADING MOTOR

• Signal path

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo (speed and phase)		▷▷▷	
Capstan speed servo		▷	
Capstan phase servo	▶▶	▷▷	▷▷
Capstan servo (speed and phase)		▷▷▷	
Ref. signal	▶		▷

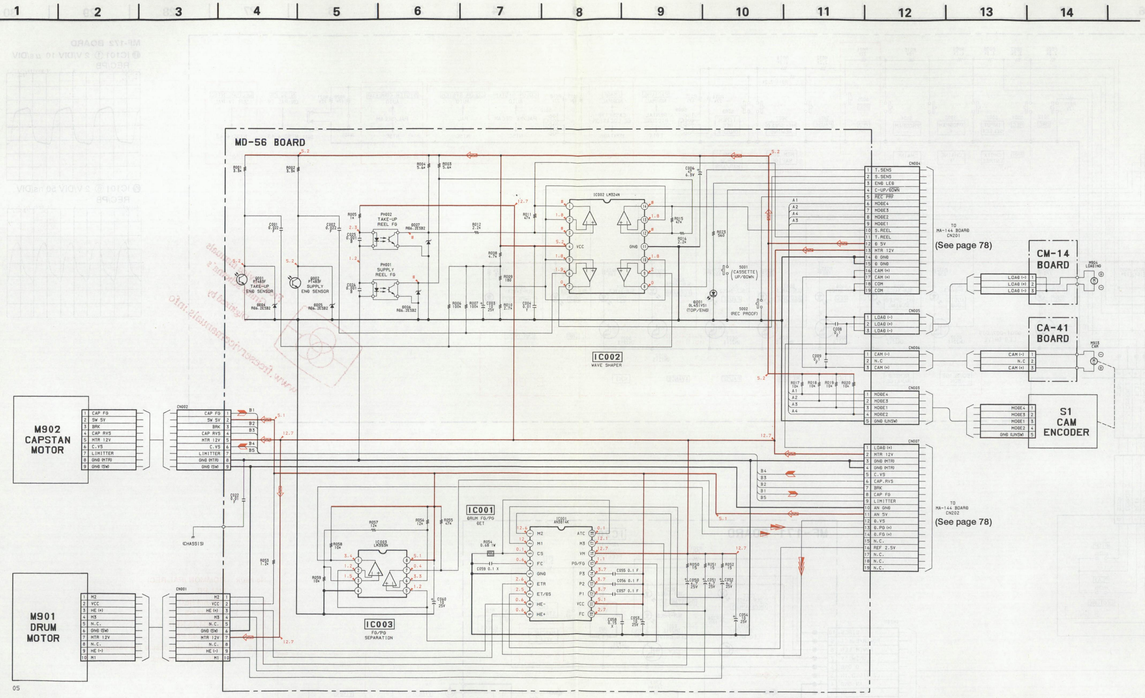
MF-171 (POWER/EJECT SWITCHES), MF-172 (MODE CONTROL), MF-173 (CONTROL SWITCHES) PRINTED WIRING BOARDS

– Ref. No.: MF-171, MF-172 and MF-173 Boards; 5,000 series –



MD-56 (MECHANISM DRIVE), CA-41 (CAM MOTOR), CM-14 (LOADING MOTOR) SCHEMATIC DIAGRAM

– Ref. No.: MD-56, CA-41 and CM-14 Boards; 3,000 series –



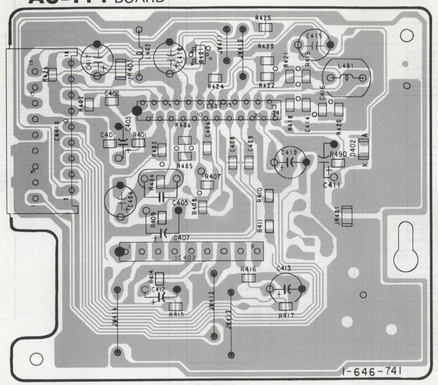
No mark : COMMON (PAL REC)
* : PAL PB
( ) : SECAM REC
(*) : SECAM PB
[ ] : NTSC4.43 REC
[*] : NTSC4.43 PB
: Impossible to measure the voltage at the marked points.

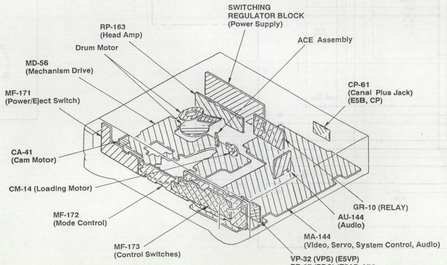
MECHANISM DRIVE

AU-144 (AUDIO) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

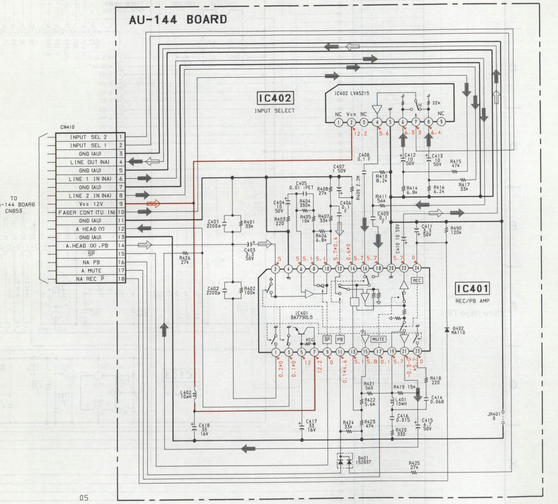
– Ref. No.: AU-144 Board; 4,000 series –

AU-144 BOARD

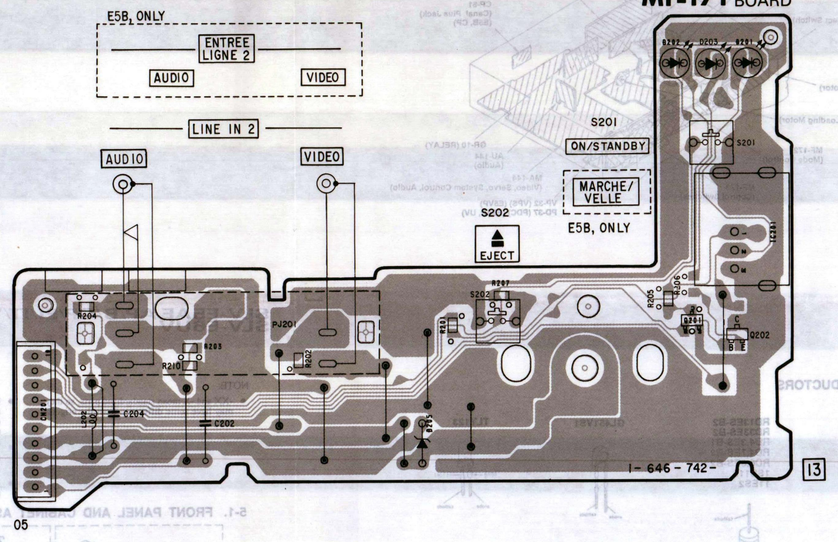




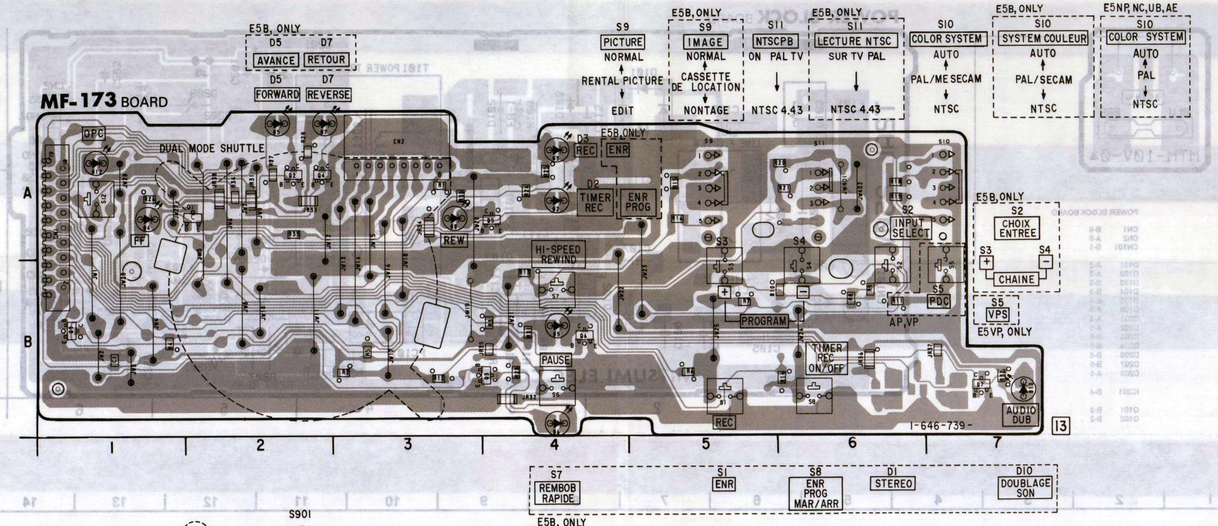
AUDIO

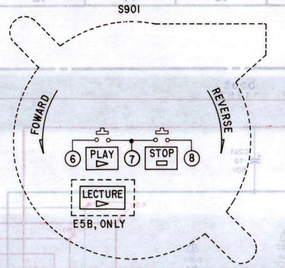


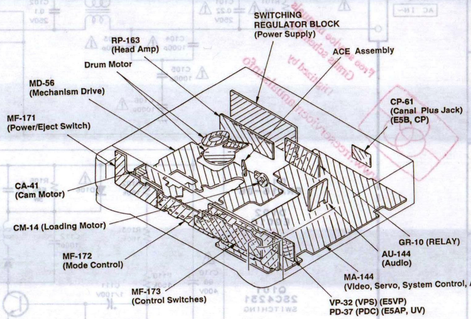
MF-171 BOARD



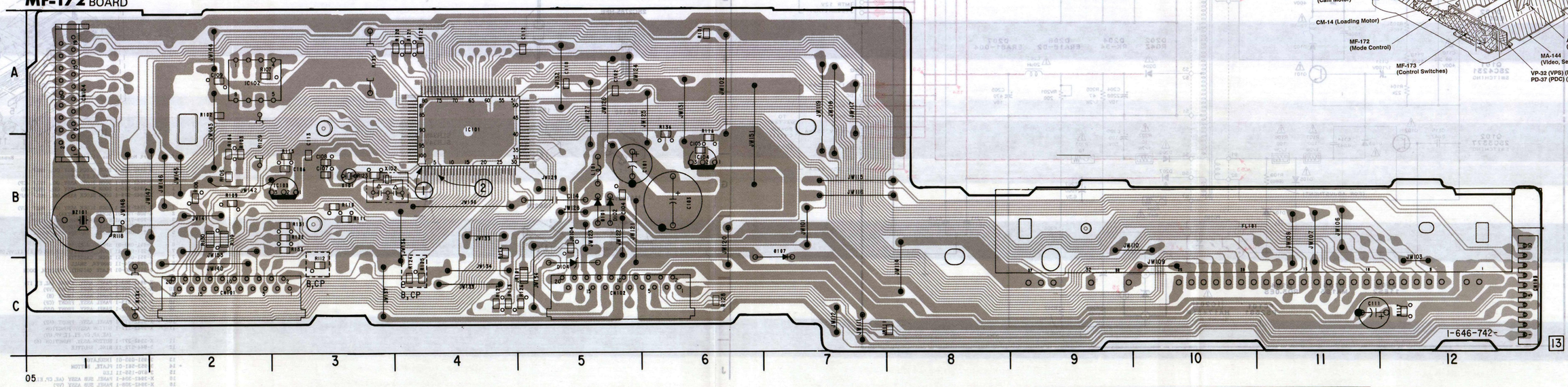
MF-173 BOARD







MF-172 BOARD

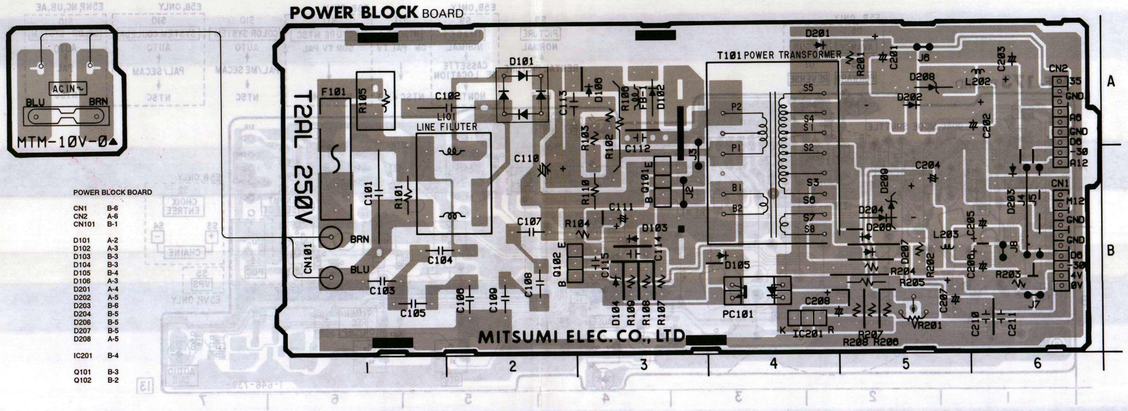


MF-172 BOARD

CN101	
CN102	
CN103	
CN104	
D101	B-5
D102	B-5
D104	C-5
D107	C-7
IC101	A-4
IC102	A-2
IC103	B-3
IC104	B-6

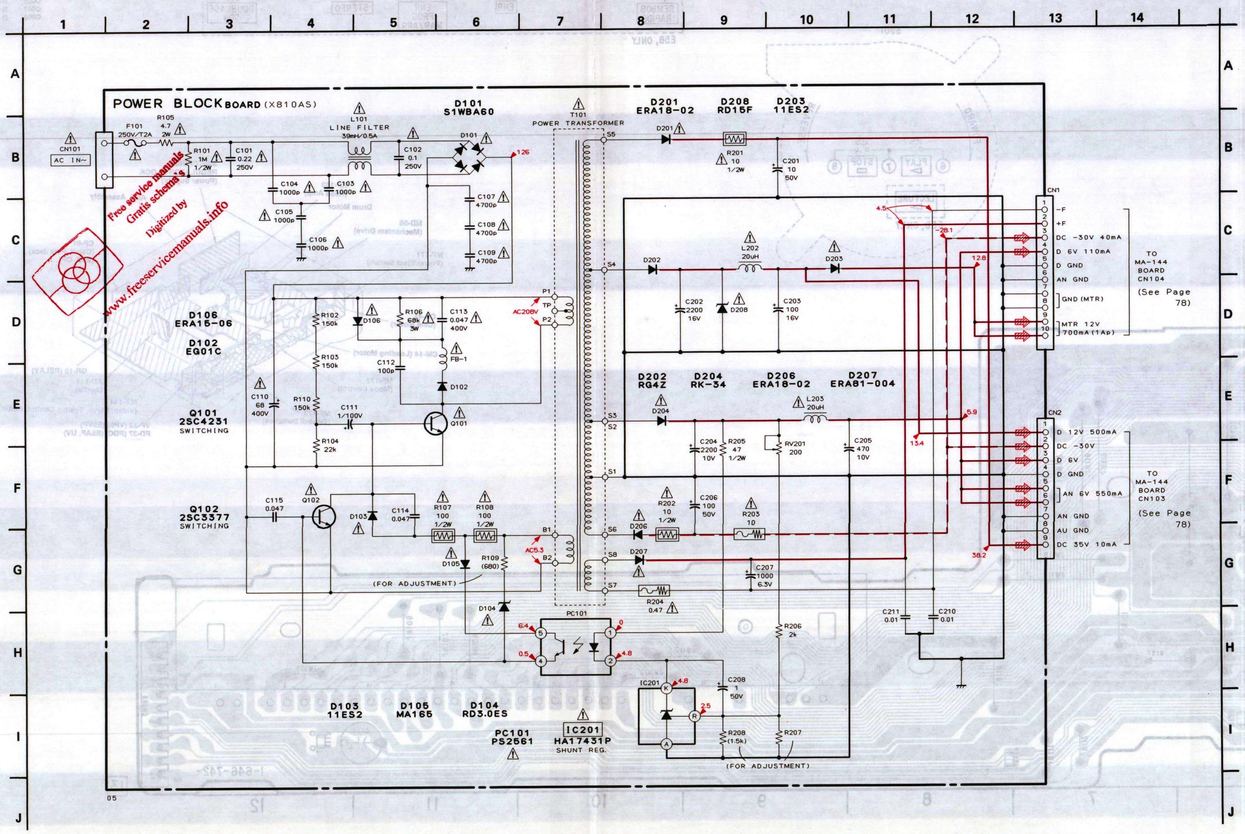
POWER BLOCK PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: POWER BLOCK Board; 7,000 series –

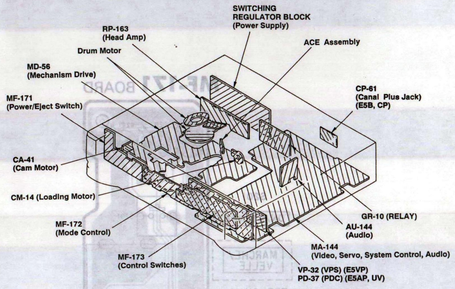


POWER BLOCK BOARD

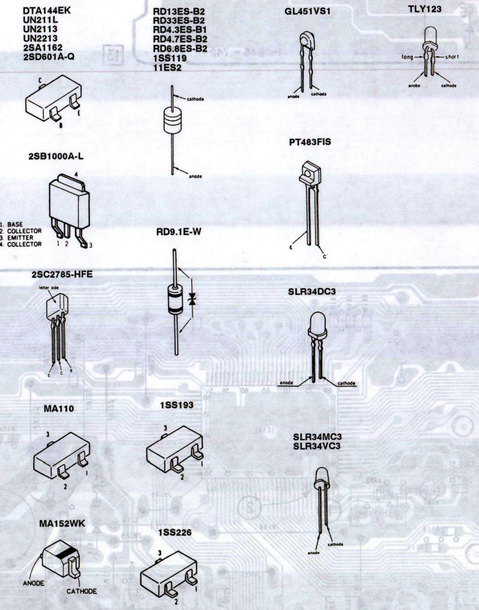
CN1	B-6
CN2	A-6
CN101	B-1
D101	A-2
D102	A-3
D103	B-3
D104	B-3
D105	B-4
D106	A-3
D201	A-4
D202	A-5
D203	B-6
D204	B-5
D205	B-5
D207	B-5
D208	A-5
IC201	B-4
Q101	B-3
Q102	B-2



POWER BLOCK POWER BLOCK



4-3. SEMICONDUCTORS



SLV-E5AE/AP/B/CP/EI/IT/VP
SLV-E6UV

SECTION 5
EXPLODED VIEWS

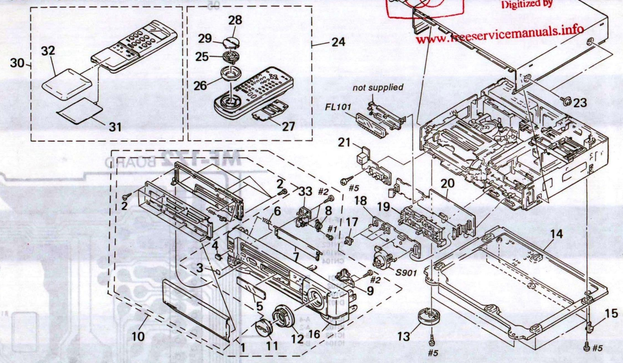
NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the list of this parts list.

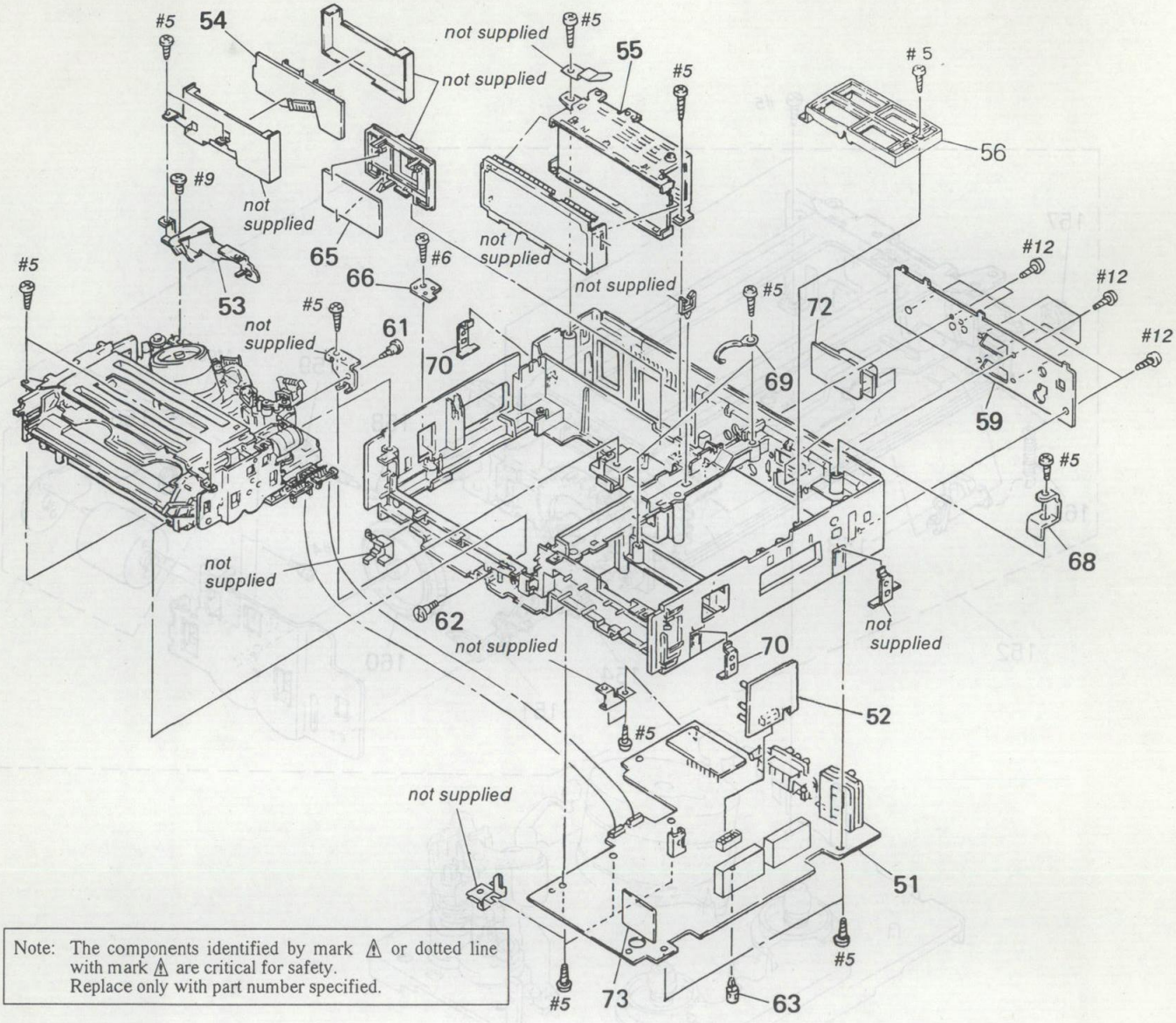
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. FRONT PANEL AND CABINET ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	X-3942-308-1	DOOR BLOCK ASSY (W), HALF (AE, EI, IT, VP)	
1	X-3942-309-1	DOOR BLOCK ASSY (W), HALF (CP)	
1	X-3942-310-1	DOOR BLOCK ASSY (W), HALF (B)	
1	X-3942-976-1	DOOR BLOCK ASSY (W), HALF (AP)	
1	X-3942-978-1	DOOR BLOCK ASSY (W), HALF (UV)	
2	4-908-782-31	SCREW (B2) (M2X4), TAPPING	
* 3	3-703-713-41	STICKER, SONY SYMBOL (10)	
4	3-846-820-01	FILTER, REMOTE CONTROL	
5	3-951-087-01	PLATE, TRANSPARENT, PANEL	
6	3-951-089-01	SPRING (GE), FL	
7	3-951-086-41	DOOR, CASSETTE (AE, AP, CP, EI, IT, VP, UV)	
7	3-951-086-51	DOOR, CASSETTE (B)	
8	3-319-224-11	DAMPER, SMALL	
9	3-951-080-01	PLATE (RIGHT), FULCRUM, DOOR	
10	X-3942-303-1	PANEL ASSY, FRONT (AE, EI, IT)	
10	X-3942-305-1	PANEL ASSY, FRONT (VP)	
10	X-3942-311-1	PANEL ASSY, FRONT (B)	
10	X-3942-313-1	PANEL ASSY, FRONT (CP)	
10	X-3942-972-1	PANEL ASSY, FRONT (UV)	
10	X-3942-975-1	PANEL ASSY, FRONT (AP)	
11	X-3942-217-1	BUTTON ASSY, FUNCTION (AE, AP, CP, EI, IT, VP, UV)	
11	X-3942-377-1	BUTTON ASSY, FUNCTION (B)	
12	3-944-572-11	RING, SHUTTLE	
13	3-951-093-01	INSULATOR	
* 14	3-953-581-01	PLATE, BOTTOM	
15	3-870-155-11	LEG	
16	X-3942-304-1	PANEL SUB ASSY (AE, CP, EI, IT)	
16	X-3942-308-1	PANEL SUB ASSY (VP)	
16	X-3942-312-1	PANEL SUB ASSY (B)	
16	X-3942-974-1	PANEL SUB ASSY (AP, UV)	
17	3-746-217-01	KNOB, SELECTION	
* 18	A-8782-001-A	MF-173 BOARD, COMPLETE (AE, B, CP, EI, IT,)	
* 18	A-8782-015-A	MF-173 BOARD, COMPLETE (AP, VP, UV)	
19	3-951-084-01	HOLDER, MF	
* 20	A-8782-000-A	MF-172 BOARD, COMPLETE (AE, AP, IT)	
* 20	A-8782-008-A	MF-172 BOARD, COMPLETE (EI)	
* 20	A-8782-010-A	MF-172 BOARD, COMPLETE (B)	
* 20	A-8782-012-A	MF-172 BOARD, COMPLETE (CP)	
* 20	A-8782-014-A	MF-172 BOARD, COMPLETE (VP)	
* 20	A-8782-017-A	MF-172 BOARD, COMPLETE (UB, UV)	
* 21	A-8754-516-A	MF-171 BOARD, COMPLETE	
22	3-741-985-01	CASE, UPPER	
23	3-710-901-11	SCREW (TP2X8), CASE	
24	1-466-918-21	REMOTE COMMANDER (RMT-V131A) (AE, AP, CP, EI, IT, VP, UV)	
24	1-466-918-41	REMOTE COMMANDER (RMT-V131C) (B)	
25	3-941-619-11	HOLDER, DIAL	
26	3-951-746-01	RING, SHUTTLE	
27	3-943-535-01	COVER, BATTERY	
28	3-941-617-81	BUTTON, PLAYBACK	
29	3-941-618-51	BUTTON, STOP	
30	1-466-935-21	REMOTE COMMANDER (RMT-AG1) (UV)	
31	3-953-580-01	COVER, BATTERY	
32	3-953-581-01	COVER, SLIDE	
33	X-3942-319-1	PLATE (LEFT) BLOCK ASSY, FULCRUM	
FL101	1-517-132-11	INDICATOR TUBE, FLUORESCENT (AE, AP, CP, EI, IT, VP, UV)	
FL101	1-517-133-11	INDICATOR TUBE, FLUORESCENT (B)	
S901	1-572-662-11	SWITCH, ROTARY (DUAL MODE SHUTTLE)	

5-2. MAIN BOARD AND POWER BLOCK ASSEMBLIES

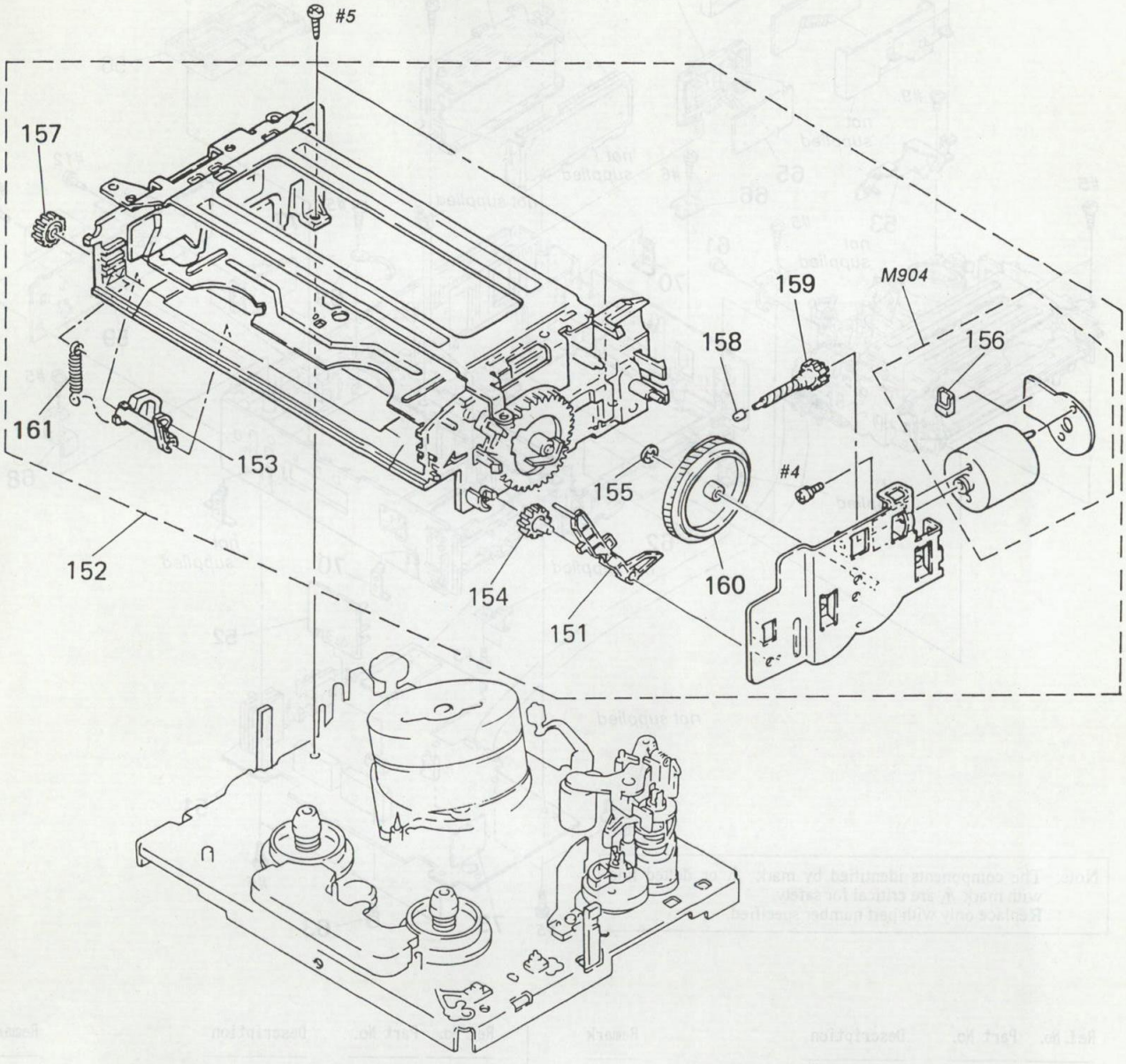


Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 51	A-6756-999-A	MA-144 BOARD, COMPLETE (AE, IT)	
* 51	A-6782-007-A	MA-144 BOARD, COMPLETE (EI)	
* 51	A-6782-009-A	MA-144 BOARD, COMPLETE (B)	
* 51	A-6782-011-A	MA-144 BOARD, COMPLETE (CP)	
* 51	A-6782-013-A	MA-144 BOARD, COMPLETE (VP)	
* 51	A-6782-018-A	MA-144 BOARD, COMPLETE (UV)	
* 51	A-6782-019-A	MA-144 BOARD, COMPLETE (AP)	
* 52	A-6712-507-A	AU-144 BOARD, COMPLETE	
53	X-3746-004-1	GROUND ASSY, SHAFT	
* 54	A-6727-490-A	RP-163 BOARD, COMPLETE	
⚠55	1-413-789-11	POWER BLOCK (AE, AP, B, CP, EI, IT, VP)	
⚠55	1-413-790-11	POWER BLOCK (UV)	
56	3-951-118-01	HOLDER, FRAME	
* 59	3-946-836-71	PLATE, ORNAMENTAL, JACK (AE, AP, EI, IT, VP, UV)	

Ref. No.	Part No.	Description	Remark
* 59	3-946-836-81	PLATE, ORNAMENTAL, JACK (CP)	
* 59	3-946-836-91	PLATE, ORNAMENTAL, JACK (B)	
61	3-736-055-01	SCREW (3X8), TAPPING	
62	3-741-948-01	SCREW (3), SPECIAL (+) TAPPING	
63	3-682-057-11	SPACER (SMALL)	
* 65	A-6756-998-A	GR-10 BOARD, COMPLETE	
66	3-749-677-01	RETAINER (LEFT), MD	
68	3-749-676-01	BRACKET, RF	
69	3-703-150-11	STOPPER, WIRING	
70	3-741-992-01	STOPPER, UPPER CASE	
* 72	1-646-744-13	CP-61 BOARD	
* 73	A-6754-476-A	VP-32 BOARD, COMPLETE (VP)	
* 73	A-6755-956-A	PD-37 BOARD, COMPLETE (AP, UV)	

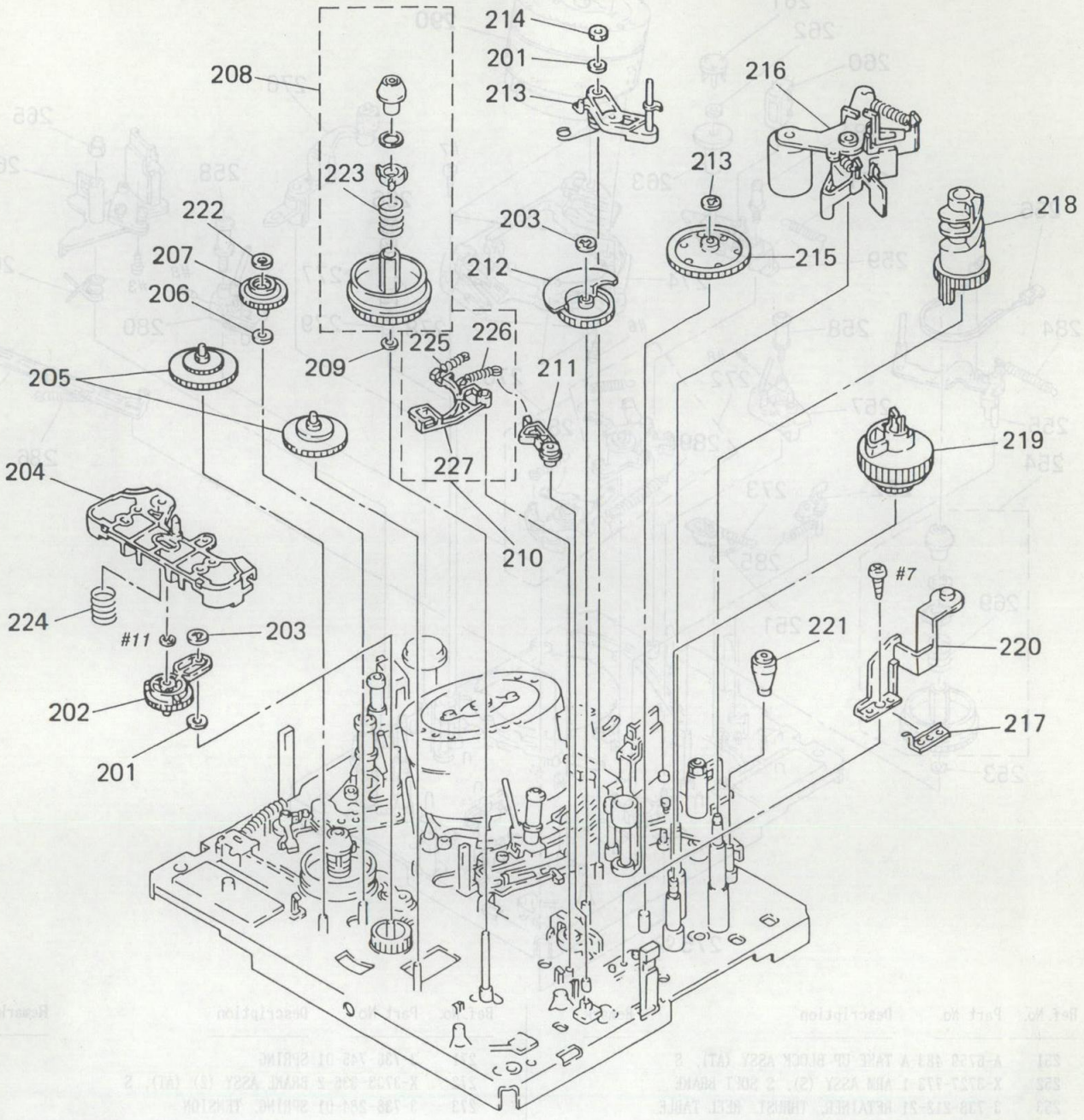
5-3. FL CASSETTE COMPARTMENT ASSEMBLY



Ref. No.	Part No.	Description	Remark
151	3-741-935-06	LEVER, FLAT DOOR	
152	A-6751-421-A	FL BLOCK ASSY (M2)	
153	3-736-163-01	LEVER, ERASING PROTECTION	
154	X-3727-775-2	GEAR (RIGHT) ASSY, MIDWAY	
155	3-696-510-01	WASHER (3), STOPPER	
156	1-506-482-11	PIN, CONNECTOR 3P	

Ref. No.	Part No.	Description	Remark
157	3-736-044-02	GEAR (LEFT), MIDWAY	
158	3-716-144-02	RETAINER, WORM	
159	3-736-100-01	GEAR (FL), WORM	
160	3-736-164-01	WHEEL (FL), WORM	
161	3-739-687-01	SPRING, TENSION	
M904	X-3727-784-1	MOTOR ASSY	

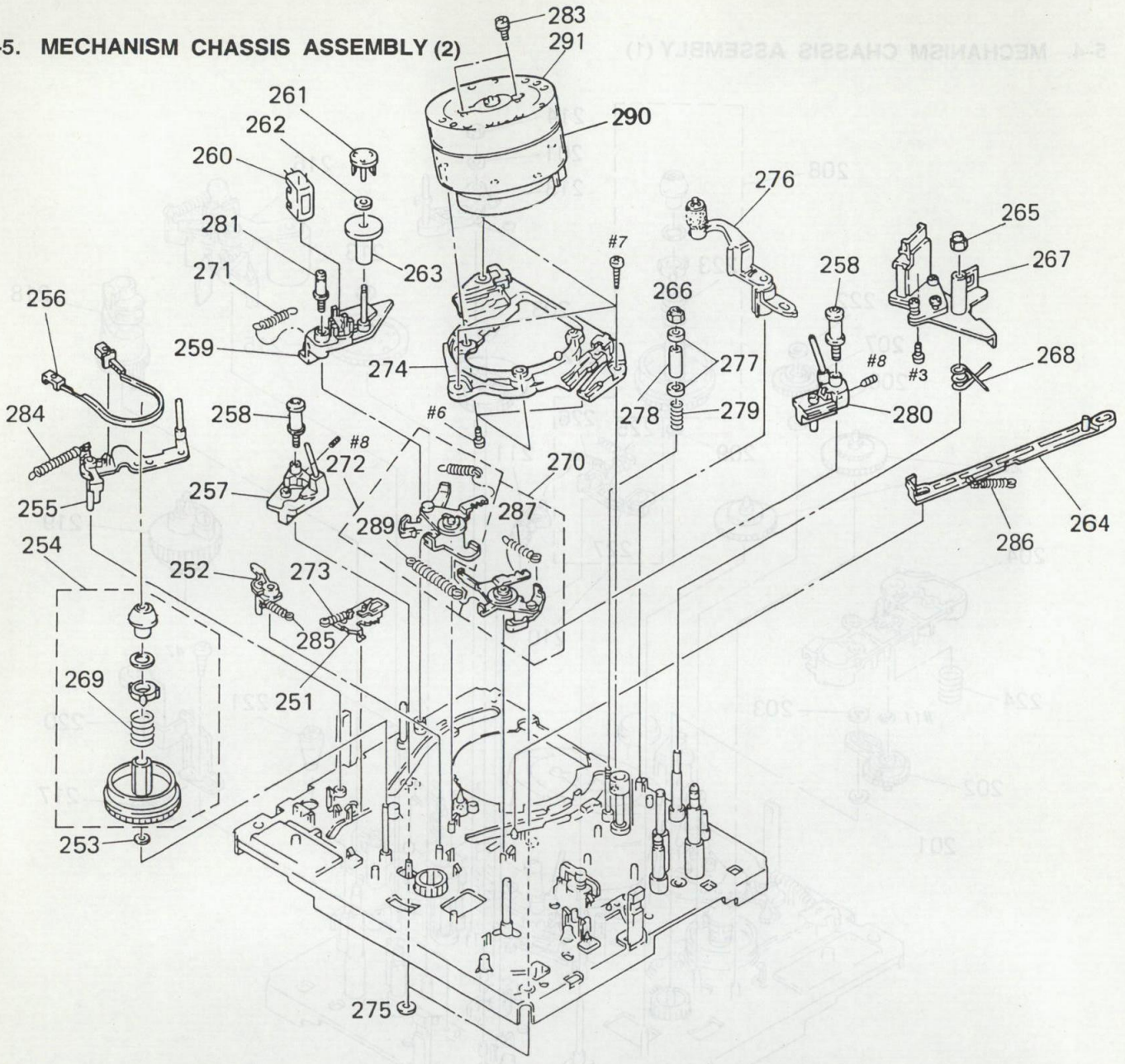
5-4. MECHANISM CHASSIS ASSEMBLY (1)



Ref. No.	Part No.	Description	Remark
201	3-701-438-11	WASHER, 2.5	
202	X-3727-776-1	ARM ASSY, PENDULUM	
203	3-669-595-00	WASHER (2), STOPPER	
204	3-736-172-02	RELEASE, LOCK, REEL	
205	X-3727-795-1	GEAR ASSY, RELAY	
206	3-736-074-01	RETAINER (SMALL), THRUST	
207	3-736-037-01	GEAR, REW	
208	X-3727-798-5	TABLE ASSY, REEL	
209	3-738-212-21	RETAINER, THRUST, REEL TABLE	
210	X-3733-335-1	BRAKE ASSY (AT), T SOFT	
211	3-736-105-01	ARM, REV BRAKE	
212	3-736-143-01	GEAR, RVS CAM	
213	X-3942-218-1	ARM ASSY, RVS	
214	3-736-740-01	NUT (M2X0.25), NYLON	

Ref. No.	Part No.	Description	Remark
215	3-736-116-01	GEAR, COMMUNICATION	
216	X-3727-770-1	PINCH ROLLER BLOCK ASSY	
217	3-942-829-01	SPRING (2) (ATOM), GROUND, FL	
218	3-952-182-01	CAM, ELEVATOR	
219	3-943-700-01	GEAR (LO), PRESS CAM	
220	3-942-828-01	OPENNER, LID	
221	3-738-250-01	SCREW, AC ADJUSTMENT	
222	3-736-069-01	RETAINER, SPRING	
223	3-739-621-01	SPRING, COMPRESSION	
224	3-736-020-11	SPRING, COMPRESSION	
225	3-736-024-01	SPRING, TENSION	
226	3-736-025-01	SPRING (REV BRAKE), TENSION	
227	3-736-075-01	BRAKE, S SOFT	

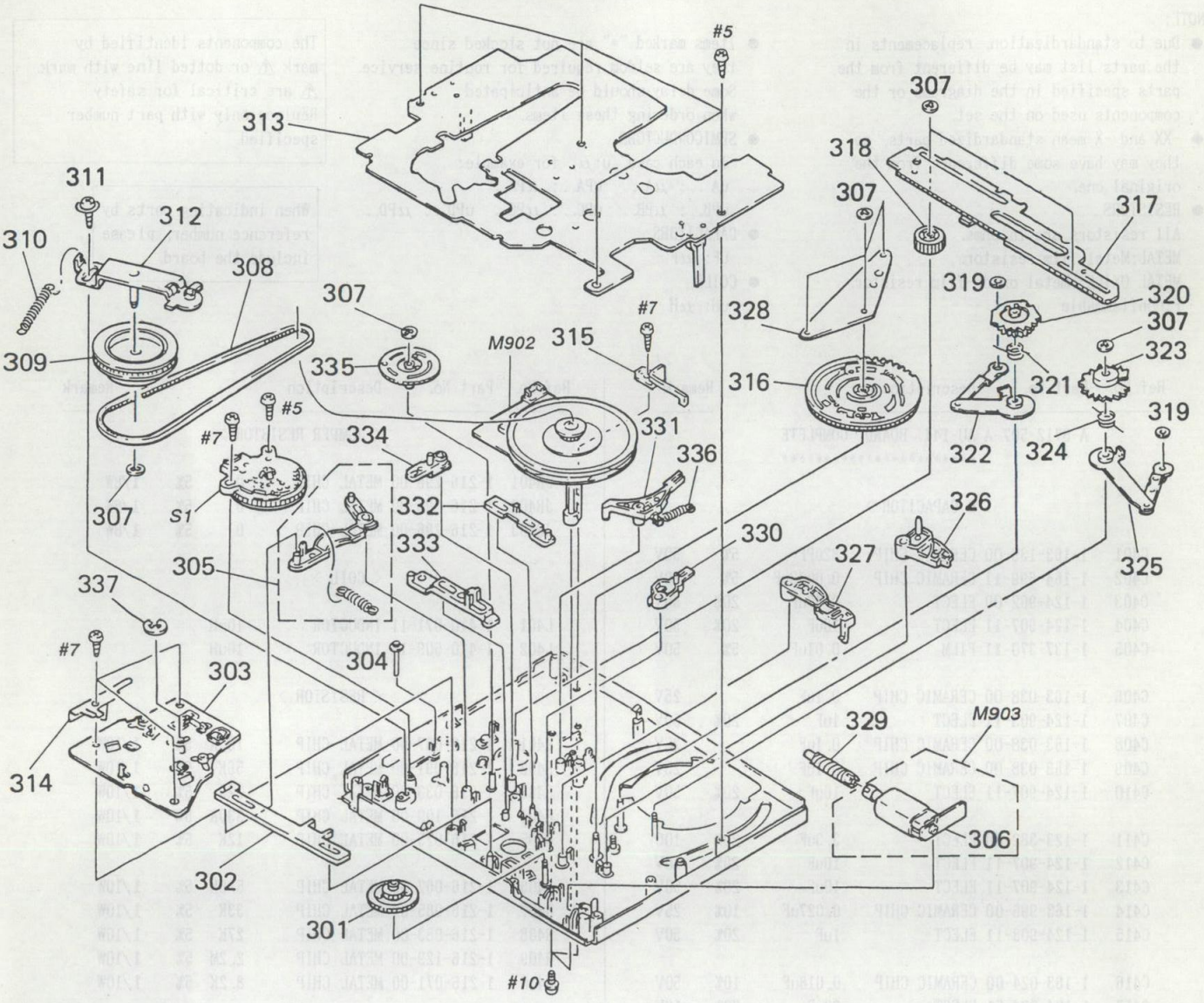
5-5. MECHANISM CHASSIS ASSEMBLY (2)



Ref. No.	Part No.	Description	Remark
251	A-6759-483-A	TAKE-UP BLOCK ASSY (AT), S	
252	X-3727-773-1	ARM ASSY (S), S SOFT BRAKE	
253	3-738-212-21	RETAINER, THRUST, REEL TABLE	
254	X-3941-194-1	TABLE ASSY, REEL, S	
255	3-736-151-11	ARM (POM), TENSION REGULATOR	
256	X-3727-797-1	BAND ASSY, TENSION REGULATOR	
257	X-3727-786-1	SHUTTLE (LEFT) ASSY	
258	X-3733-301-1	ROLLER ASSY, GUIDE	
259	X-3942-452-1	STABILIZER (BASE) ASSY, B	
260	1-543-647-11	HEAD, FE	
261	3-736-082-01	RETAINER, TS THRUST	
262	3-741-925-01	RING, RETAINING	
263	X-3727-771-1	STABILIZER ASSY, TAPE	
264	X-3743-517-1	LEVER (S), RELEASE, C ROLLER	
265	3-942-867-01	NUT, AC HEIGHT ADJUSTMENT	
266	3-942-866-01	NUT (M3) (3X0.5), NYLON	
267	A-6761-129-A	HEAD BLOCK ASSY, ACE	
268	3-944-833-01	SPRING, TORSION	
269	3-739-621-01	SPRING, COMPRESSION	
270	X-3729-926-1	BRAKE ASSY (2), T	

Ref. No.	Part No.	Description	Remark
271	3-736-745-01	SPRING	
272	X-3733-336-2	BRAKE ASSY (2) (AT), S	
273	3-738-284-01	SPRING, TENSION	
274	X-3746-005-1	BASE ASSY (G), DRUM	
275	3-736-073-01	SLIDER, POLYETHYLENE	
276	A-6747-267-A	ARM BLOCK ASSY (S), C ROLLER	
277	3-944-033-01	FLANGE, 7 GUIDE	
278	3-736-730-01	SLEEVE, #7 GUIDE	
279	3-749-099-01	SPRING (#7 GUIDE), COMPRESSION	
280	X-3727-787-1	SHUTTLE (RIGHT) ASSY	
281	X-3727-788-1	ROLLER ASSY, GUIDE, #2	
283	2-643-205-01	SCREW (PSW) 3X8	
284	3-733-389-11	SPRING, TENSION	
285	3-736-047-01	SPRING (S SOFT), TENSION	
286	3-736-735-03	SPRING, TENSION	
287	3-738-220-01	SPRING (MAIN BRAKE 2), TENSION	
289	3-738-221-01	SPRING (MAIN BRAKE 1), TENSION	
290	1-550-870-11	DRUM ASSY, ROTARY BOTTOM (DZL-59A-R)	
291	1-550-869-11	DRUM ASSY, ROTARY UPPER (DZR-59-R)	

5-6. MECHANISM CHASSIS ASSEMBLY (3)



Ref. No.	Part No.	Description	Remark
301	3-736-015-01	WHEEL (CAM), WORM	
302	3-736-158-01	PLATE, SLIDE, PENDULUM	
303	A-6739-084-A	CHASSIS BLOCK ASSY, SUB	
304	3-736-091-01	PIN, SWITCH	
305	X-3729-924-1	ARM ASSY, PENDULUM FUNCTION	
* 306	1-633-460-11	CA-41 BOARD	
307	3-669-595-00	WASHER (2), STOPPER	
308	3-736-013-01	BELT, TIMING	
309	X-3727-782-1	PULLEY ASSY	
310	3-736-089-01	SPRING, TENSION	
311	3-733-386-01	SCREW (3X8), WASHER	
312	X-3727-761-1	ARM ASSY, ADJUSTMENT	
* 313	A-6754-472-A	MD-56 BOARD, COMPLETE	
314	3-741-950-01	SPRING (AT), LEAF, SC GROUND	
315	3-736-744-01	RETAINER, ROTOR	
316	3-736-176-01	GEAR, CAM	
317	3-736-177-01	PLATE, SLIDE, MODE	
318	3-733-394-01	GEAR, RVS RELAY	
319	3-736-073-01	SLIDER, POLYETHYLENE	
320	3-736-148-01	GEAR (RIGHT), THREADING	

Ref. No.	Part No.	Description	Remark
321	3-736-092-01	SPRING (RIGHT), TORSION	
322	X-3727-777-1	ARM (RIGHT) ASSY, THREADING	
323	3-736-147-01	GEAR (LEFT), THREADING	
324	3-736-040-01	SPRING (LEFT), TORSION	
325	X-3727-778-1	ARM (LEFT) ASSY, THREADING	
326	3-736-142-01	ARM, TENSION REGULATOR FUNCTION	
327	3-736-140-01	ARM, S TAKE-UP	
328	3-733-396-01	HOLDER, CAM GEAR	
329	3-733-395-01	GEAR (CAM), WORM	
330	3-733-397-01	ARM, BRAKE FUNCTION	
331	X-3733-338-1	BRAKE ASSY (AT), CAP	
332	3-733-398-01	PLATE, SLIDE, BRAKE	
333	3-736-103-01	PLATE, SLIDE, LIMITER	
334	3-736-016-01	ARM, LIMITER FUNCTION	
335	3-736-170-01	GEAR, RKB CAM	
336	3-738-237-01	SPRING (CAP BRAKE), TENSION	
337	3-669-465-00	WASHER (1.5), STOPPER	
M902	8-835-489-01	MOTOR, DC U-26K	
M903	X-3733-302-1	MOTOR ASSY, CAM	
S1	1-692-062-11	SWITCH, ROTARY	

AU-144

SECTION 6
ELECTRICAL PARTS LIST

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref.No.	Part No.	Description			Remark
*	A-6712-507-A	AU-144 BOARD, COMPLETE **********			
		< CAPACITOR >			
C401	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C402	1-164-699-11	CERAMIC CHIP	0.0033uF	5%	50V
C403	1-124-902-00	ELECT	0.47uF	20%	50V
C404	1-124-907-11	ELECT	10uF	20%	50V
C405	1-137-370-11	FILM	0.01uF	5%	50V
C406	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C407	1-124-903-11	ELECT	1uF	20%	50V
C408	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C409	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C410	1-124-907-11	ELECT	10uF	20%	50V
C411	1-123-382-00	ELECT	3.3uF	20%	100V
C412	1-124-907-11	ELECT	10uF	20%	50V
C413	1-124-907-11	ELECT	10uF	20%	50V
C414	1-163-986-00	CERAMIC CHIP	0.027uF	10%	25V
C415	1-124-903-11	ELECT	1uF	20%	50V
C416	1-163-024-00	CERAMIC CHIP	0.018uF	10%	50V
C417	1-124-034-51	ELECT	33uF	20%	16V
C418	1-124-034-51	ELECT	33uF	20%	16V
		< CONNECTOR >			
CN410	1-695-938-11	CONNECTOR, BOARD TO BOARD 18P			
		< DIODE >			
D401	8-719-400-18	DIODE MA152WK			
D402	8-719-404-46	DIODE MA110			
		< IC >			
IC401	8-759-089-82	IC BA7790LS			
IC402	8-759-513-05	IC LVA521S			

Ref.No.	Part No.	Description			Remark
		< JUMPER RESISTOR >			
JR401	1-216-296-00	METAL CHIP	0	5%	1/8W
JR402	1-216-296-00	METAL CHIP	0	5%	1/8W
JR403	1-216-296-00	METAL CHIP	0	5%	1/8W
		< COIL >			
L401	1-410-071-11	INDUCTOR	10mH		
L402	1-410-509-11	INDUCTOR	10uH		
		< RESISTOR >			
R401	1-216-097-00	METAL CHIP	100K	5%	1/10W
R402	1-216-091-00	METAL CHIP	56K	5%	1/10W
R403	1-216-033-00	METAL CHIP	220	5%	1/10W
R404	1-216-109-00	METAL CHIP	330K	5%	1/10W
R405	1-216-075-00	METAL CHIP	12K	5%	1/10W
R406	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R407	1-216-085-00	METAL CHIP	33K	5%	1/10W
R408	1-216-083-00	METAL CHIP	27K	5%	1/10W
R409	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R410	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R411	1-216-091-00	METAL CHIP	56K	5%	1/10W
R414	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R415	1-216-089-00	METAL CHIP	47K	5%	1/10W
R416	1-216-068-00	METAL CHIP	6200	5%	1/10W
R417	1-216-085-00	METAL CHIP	33K	5%	1/10W
R418	1-216-049-00	METAL CHIP	1K	5%	1/10W
R419	1-216-082-00	METAL GLAZE	24K	5%	1/10W
R420	1-216-035-00	METAL CHIP	270	5%	1/10W
R421	1-216-049-00	METAL CHIP	1K	5%	1/10W
R422	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R423	1-216-089-00	METAL CHIP	47K	5%	1/10W
R424	1-216-085-00	METAL CHIP	33K	5%	1/10W
R425	1-216-083-00	METAL CHIP	27K	5%	1/10W
R426	1-216-083-00	METAL CHIP	27K	5%	1/10W
R490	1-219-099-00	CHIP RESISTOR	120K	5%	1/4W

Ref. No.	Part No.	Description			Remark
**********					
*	1-646-744-13	CP-61 BOARD (CP, B)			
		**********			
		< CONNECTOR >			
* CN251	1-691-620-21	SOCKET, CONNECTOR 8P			
* CN252	1-691-621-11	SOCKET, CONNECTOR 9P			
CNJ251	1-561-534-41	SOCKET, PIN 21P			
		< JUMPER RESISTOR >			
JR251	1-216-295-00	METAL CHIP	0	5% 1/10W	
JR252	1-216-295-00	METAL CHIP	0	5% 1/10W	
**********					
*	A-6756-998-A	GR-10 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C107	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C108	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C110	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C133	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C137	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C138	1-124-589-11	ELECT	47uF	20%	16V
C139	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C143	1-165-319-11	CERAMIC CHIP	0.1uF		50V
		< CONNECTOR >			
CN101	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P			
CN102	1-506-490-21	PIN, CONNECTOR 11P			
* CN103	1-564-018-51	PIN, CONNECTOR 8P			
		< IC >			
IC103	8-759-097-80	IC HD49783FP-T1			
		< JUMPER RESISTOR >			
JR101	1-216-296-00	METAL CHIP	0	5% 1/8W	
JR102	1-216-295-00	METAL CHIP	0	5% 1/10W	
		< COIL >			
L114	1-410-521-11	INDUCTOR 100uH			
		< TRANSISTOR >			
Q102	8-729-424-18	TRANSISTOR UN2113			
Q120	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q121	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q126	8-729-424-18	TRANSISTOR UN2113			
Q127	8-729-421-19	TRANSISTOR UN2213			
Q139	8-729-421-19	TRANSISTOR UN2213			
		< RESISTOR >			
R102	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R103	1-216-295-00	METAL CHIP	0	5% 1/10W	
R104	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R105	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R106	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R107	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R108	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R147	1-216-067-00	METAL CHIP	5.6K	5% 1/10W	
R148	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R149	1-216-045-00	METAL CHIP	680	5% 1/10W	
R150	1-216-043-00	METAL CHIP	560	5% 1/10W	
R151	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R152	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R153	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R154	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R155	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R156	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R157	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R158	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R159	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R160	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R162	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R165	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R166	1-216-083-00	METAL CHIP	27K	5% 1/10W	
**********					
*	A-6756-999-A	MA-144 BOARD, COMPLETE (AE, IT)			
		**********			
*	A-6782-007-A	MA-144 BOARD, COMPLETE (EI)			
		**********			
*	A-6782-009-A	MA-144 BOARD, COMPLETE (B)			
		**********			
*	A-6782-011-A	MA-144 BOARD, COMPLETE (CP)			
		**********			
	A-6782-013-A	MA-144 BOARD, COMPLETE (VP)			
		**********			
*	A-6782-018-A	MA-144 BOARD, COMPLETE (UV)			
		**********			
*	A-6782-019-A	MA-144 BOARD, COMPLETE (AP)			
		**********			
	1-558-924-21	CABLE, PIN			
	3-951-893-01	HEAT SINK			
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3			
		< CAPACITOR >			
C101	1-163-031-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remark
C102	1-124-589-11	ELECT	47uF	20%	16V
C103	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C104	1-124-916-11	ELECT	22uF	20%	63V
C105	1-124-443-00	ELECT	100uF	20%	6.3V
C106	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C107	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C108	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C109	1-124-925-11	ELECT	2.2uF	20%	100V
C111	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C112	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C113	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C114	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C115	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C116	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C117	1-124-925-11	ELECT	2.2uF	20%	100V
C118	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C119	1-124-916-11	ELECT	22uF	20%	63V
C131	1-124-477-11	ELECT	47uF	20%	25V
C132	1-124-584-00	ELECT	100uF	20%	10V
C135	1-124-477-11	ELECT	47uF	20%	25V
C136	1-126-101-11	ELECT	100uF	20%	16V
C140	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C141	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C142	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C143	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C145	1-162-306-11	CERAMIC	0.01uF	20%	16V (VP)
C201	1-162-306-11	CERAMIC	0.01uF	20%	16V
C203	1-126-101-11	ELECT	100uF	20%	16V
C204	1-130-495-00	MYLAR	0.1uF	5%	50V
C205	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C206	1-124-916-11	ELECT	22uF	20%	63V
C207	1-130-487-00	MYLAR	0.022uF	5%	50V
C208	1-124-925-11	ELECT	2.2uF	20%	100V
C209	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C210	1-124-443-00	ELECT	100uF	20%	6.3V
C211	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C212	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C213	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C214	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C215	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C304	1-163-105-00	CERAMIC CHIP (B, VP)	33PF	5%	50V
C305	1-163-107-00	CERAMIC CHIP (B, VP)	39PF	5%	50V
C306	1-124-126-00	ELECT	47uF	20%	10V
C307	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C308	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C309	1-124-126-00	ELECT	47uF	20%	10V
C310	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V

Ref. No.	Part No.	Description			Remark
C311	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C312	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C313	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C316	1-124-925-11	ELECT	2.2uF	20%	100V
C317	1-164-343-11	CERAMIC CHIP	0.056uF	10%	25V
C318	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C319	1-124-126-00	ELECT	47uF	20%	10V
C320	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C321	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C322	1-124-903-11	ELECT	1uF	20%	50V
C323	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C324	1-124-126-00	ELECT	47uF	20%	10V
C325	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C326	1-124-126-00	ELECT	47uF	20%	10V
C327	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C340	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C504	1-163-121-00	CERAMIC CHIP (B, CP)	150PF	5%	50V
C506	1-163-121-00	CERAMIC CHIP (B, CP)	150PF	5%	50V
C508	1-163-009-11	CERAMIC CHIP (B, CP)	0.001uF	10%	50V
C510	1-163-009-11	CERAMIC CHIP (B, CP)	0.001uF	10%	50V
C516	1-124-126-00	ELECT (B, CP)	47uF	20%	10V
C518	1-124-126-00	ELECT (B, CP)	47uF	20%	10V
C601	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C602	1-163-125-00	CERAMIC CHIP (B, VP)	220PF	5%	50V
C603	1-163-117-00	CERAMIC CHIP (B, VP)	100PF	5%	50V
C603	1-163-129-00	CERAMIC CHIP (AE, AP, CP, EI, IT, UV)	330PF	5%	50V
C604	1-124-589-11	ELECT	47uF	20%	16V
C605	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C606	1-162-306-11	CERAMIC	0.01uF	20%	16V
C607	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C609	1-162-306-11	CERAMIC	0.01uF	20%	16V
C610	1-124-589-11	ELECT	47uF	20%	16V
C612	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C613	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C614	1-124-589-11	ELECT	47uF	20%	16V
C615	1-163-033-00	CERAMIC CHIP	0.022uF		50V (B)
C616	1-163-129-00	CERAMIC CHIP	330PF	5%	50V (B)
C617	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C618	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C619	1-163-113-00	CERAMIC CHIP	68PF	5%	50V

Ref. No.	Part No.	Description			Remark
C620	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C621	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C623	1-124-126-00	ELECT	47uF	20%	10V
C624	1-124-589-11	ELECT	47uF	20%	16V (B)
C625	1-124-589-11	ELECT	47uF	20%	16V (B)
C626	1-124-907-11	ELECT	10uF	20%	50V
C627	1-124-126-00	ELECT	47uF	20%	10V
C628	1-124-126-00	ELECT (B, VP)	47uF	20%	10V
C629	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C630	1-163-091-00	CERAMIC CHIP	8PF		50V
C651	1-124-907-11	ELECT	10uF	20%	50V
C652	1-124-907-11	ELECT	10uF	20%	50V
C653	1-124-907-11	ELECT	10uF	20%	50V
C654	1-163-031-11	CERAMIC CHIP (AE, AP, B, CP, EI, IT, UV)	0.01uF		50V
C660	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C690	1-164-066-11	CERAMIC	68PF	5%	50V (VP)
C701	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C702	1-124-126-00	ELECT	47uF	20%	10V
C703	1-124-472-11	ELECT (B, CP, EI, VP, UV)	470uF	20%	10V
C704	1-124-126-00	ELECT	47uF	20%	10V
C705	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C709	1-163-205-00	CERAMIC CHIP	0.001uF	5%	50V (VP)
C711	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C714	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C716	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C801	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V (VP)
C802	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V (VP)
C803	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V (VP)
C804	1-124-916-11	ELECT	22uF	20%	63V
C805	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V (VP)
C806	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V (VP)
C808	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C809	1-126-101-11	ELECT	100uF	20%	16V
C810	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C811	1-124-927-11	ELECT	4.7uF	20%	100V
C812	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C813	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C814	1-124-126-00	ELECT	47uF	20%	10V
C817	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C819	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C820	1-124-126-00	ELECT	47uF	20%	10V
C821	1-162-209-31	CERAMIC (EI, UV)	27PF	5%	50V
C821	1-162-213-31	CERAMIC (AE, AP, CP, IT, VP)	39PF	5%	50V
C822	1-163-237-11	CERAMIC CHIP (UV)	27PF	5%	50V
C822	1-163-239-11	CERAMIC CHIP (AE, AP, CP, IT, VP)	33PF	5%	50V
C822	1-163-243-11	CERAMIC CHIP	47PF	5%	50V (EI)
C826	1-124-907-11	ELECT	10uF	20%	50V
C852	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C853	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C854	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C855	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C856	1-137-612-11	FILM	0.0068uF		100V
C857	1-104-697-11	FILM	0.047uF	5%	100V
C858	1-104-695-11	FILM	330PF	5%	100V
C859	1-124-477-11	ELECT	47uF	20%	16V
C860	1-124-477-11	ELECT	47uF	20%	16V

< CONNECTOR >

CJ701	1-695-935-11	CONNECTOR (SQUARE TYPE)	21P
* CN032	1-565-439-11	PIN, CONNECTOR (PCB)	10P (AP, UV)
CN101	1-506-468-11	PIN, CONNECTOR	3P
CN103	1-568-786-11	PIN, CONNECTOR	9P
CN104	1-568-787-11	PIN, CONNECTOR	10P
CN201	1-569-338-11	CONNECTOR, BOARD TO BOARD	19P
CN202	1-569-338-11	CONNECTOR, BOARD TO BOARD	19P
CN401	1-691-702-11	CONNECTOR, BOARD TO BOARD	20P
CN402	1-691-702-11	CONNECTOR, BOARD TO BOARD	20P
* CN501	1-691-908-11	CONNECTOR, WIRE TRAP	8P (B, CP)
* CN502	1-695-520-11	CONNECTOR, WIRE TRAP	9P (B, CP)
CN601	1-569-341-11	CONNECTOR, BOARD TO BOARD	19P
CN853	1-695-939-11	CONNECTOR, BOARD TO BOARD	18P
* CN854	1-560-892-00	PIN, CONNECTOR	4P
* CN855	1-560-891-00	PIN, CONNECTOR	3P
* CN857	1-560-892-00	PIN, CONNECTOR	4P

< DIODE >

⚠D101	8-719-200-76	DIODE	10E1N
⚠D102	8-719-200-76	DIODE	10E1N
D103	8-719-911-19	DIODE	1SS119
D104	8-719-911-19	DIODE	1SS119
D131	8-719-801-48	DIODE	1SS193
D201	8-719-108-24	DIODE	1SS223
D202	8-719-109-74	DIODE	RD4.3ES-B1
D203	8-719-109-81	DIODE	RD4.7ES-B2
D204	8-719-200-82	DIODE	11ES2
D206	8-719-801-48	DIODE	1SS193
D207	8-719-108-24	DIODE	1SS223

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
D301	8-719-200-82	DIODE 11ES2	
D302	8-719-801-48	DIODE 1SS193	
D501	8-719-109-96	DIODE RD6.8ES-B1 (B,CP)	
D502	8-719-109-96	DIODE RD6.8ES-B1 (B,CP)	
D503	8-719-109-96	DIODE RD6.8ES-B1 (B,CP)	
D505	8-719-109-96	DIODE RD6.8ES-B1 (B,CP)	
D506	8-719-110-36	DIODE RD13ES-B2 (B,CP)	
D601	8-719-400-18	DIODE MA152WK (B)	
D602	8-719-911-19	DIODE 1SS119 (B)	
D603	8-719-911-19	DIODE 1SS119 (VP)	
D604	8-719-911-19	DIODE 1SS119	
D605	8-719-911-19	DIODE 1SS119	
D701	8-719-109-96	DIODE RD6.8ES-B1	
D702	8-719-109-96	DIODE RD6.8ES-B1	
D704	8-719-109-96	DIODE RD6.8ES-B1 (B,CP)	
D703	8-719-108-12	DIODE RD9.1E-W	
D705	8-719-110-36	DIODE RD13ES-B2	
D706	8-719-109-74	DIODE RD4.3ES-B1	
D707	8-719-109-96	DIODE RD6.8ES-B1	
D708	8-719-109-96	DIODE RD6.8ES-B1	
D709	8-719-109-96	DIODE RD6.8ES-B1	
D710	8-719-109-96	DIODE RD6.8ES-B1	
D801	8-719-110-78	DIODE RD33ES-B2	
D802	8-719-800-76	DIODE 1SS226	
D899	8-719-911-19	DIODE 1SS119	
		< DELAY LINE >	
DL601	1-415-728-31	DELAY LINE, 2H (ULTRASONIC)	
DL602	1-415-856-11	DELAY LINE, ULTRASONIC GLASS	
		< IC >	
IC101	8-759-246-14	IC TA8823N	
⚠IC131	8-759-513-73	IC PQ09RF11	
⚠IC132	8-759-513-72	IC PQ12RF11	
IC201	8-759-983-45	IC BA6238A	
IC202	8-759-981-48	IC RC082M2G2	
IC203	8-752-844-32	IC CXP80724-VSX1800G	
IC204	8-759-970-89	IC BA10358F	
IC301	8-759-089-79	IC MB90085PF-129	
IC302	8-759-164-09	IC LA7218M-DE-R	
IC501	1-809-953-11	IC CANAL PLUS MODULE BX8185 (B,CP)	
IC601	1-809-957-12	IC H8B7220B	
IC602	1-809-959-11	IC TME656 (B)	
IC603	1-809-958-11	IC BX8189 (B,VP)	
IC605	8-759-511-44	IC LVA522SA	
		< JUMPER RESISTOR >	
JR101	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR102	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR103	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR104	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR105	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR106	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR107	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR108	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR109	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR110	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR111	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR112	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR113	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR114	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR115	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR116	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR117	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR119	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR120	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR121	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR122	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR123	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR124	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR125	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR126	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR127	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR128	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR129	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR130	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR131	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR132	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR133	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR134	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR135	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR136	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR137	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR138	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR139	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR140	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR141	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR142	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR143	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR144	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR145	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR146	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR147	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR148	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR149	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR150	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR151	1-216-295-00	METAL CHIP 0 5% 1/10W	

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
JR152	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR153	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR154	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR155	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR200	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR373	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR374	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR375	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR901	1-216-296-00	METAL CHIP	0	5%	1/8W	(VP)
JR903	1-216-296-00	METAL CHIP	0	5%	1/8W	
		(AE, AP, EI, IT, VP, UV)				
JR906	1-216-295-00	METAL CHIP	0	5%	1/10W	(B, CP)
JR907	1-216-295-00	METAL CHIP	0	5%	1/10W	(B, CP)
JR911	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR912	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR913	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR921	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR927	1-216-295-00	METAL CHIP	0	5%	1/10W	(B, CP)
JR929	1-216-295-00	METAL CHIP	0	5%	1/10W	(B, CP)
JR933	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR934	1-216-295-00	METAL CHIP	0	5%	1/10W	(VP)
JR936	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR938	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR941	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR944	1-216-296-00	METAL CHIP	0	5%	1/8W	(AP, VP, UV)
JR946	1-216-296-00	METAL CHIP	0	5%	1/8W	(AP)
JR947	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR951	1-216-295-00	METAL CHIP	0	5%	1/10W	
		(AE, AP, EI, IT, VP, UV)				
		< JUMPER RESISTOR >				
JW204	1-249-429-11	ARBON	10K	5%	1/4W	
		< COIL >				
L101	1-414-189-31	INDUCTOR 100uH				
L102	1-410-521-11	INDUCTOR 100uH				
L103	1-410-519-11	INDUCTOR 68uH				
L201	1-410-513-11	INDUCTOR 22uH				
L202	1-414-183-41	INDUCTOR 10uH				
L301	1-414-189-31	INDUCTOR 100uH				
L302	1-414-186-31	INDUCTOR 33uH				(B, VP)
L303	1-408-413-00	INDUCTOR 22uH				
L304	1-410-521-11	INDUCTOR 100uH				
L501	1-410-525-11	INDUCTOR 220uH				(B, CP)
L503	1-410-525-11	INDUCTOR 220uH				(B, CP)
L601	1-414-189-31	INDUCTOR 100uH				
L602	1-408-424-00	INDUCTOR 180uH				
L603	1-414-189-31	INDUCTOR 100uH				
L605	1-414-184-41	INDUCTOR 15uH				

Ref. No.	Part No.	Description	Remark
L606	1-410-511-11	INDUCTOR 15uH	
L607	1-414-189-31	INDUCTOR 100uH	
L608	1-410-519-11	INDUCTOR 68uH	(B)
L609	1-408-421-00	INDUCTOR 100uH	
L610	1-414-189-31	INDUCTOR 100uH	
L611	1-414-189-31	INDUCTOR 100uH	(B)
L613	1-414-189-31	INDUCTOR 100uH	(B, VP)
L612	1-414-189-31	INDUCTOR 100uH	
L614	1-410-519-11	INDUCTOR 68uH	
L651	1-414-183-41	INDUCTOR 10uH	
L701	1-414-189-31	INDUCTOR 100uH	
L702	1-408-425-00	INDUCTOR 220uH	
L704	1-410-525-11	INDUCTOR 220uH	
L706	1-408-401-00	INDUCTOR 2.2uH	
L708	1-408-401-00	INDUCTOR 2.2uH	
L801	1-414-189-31	INDUCTOR 100uH	
L802	1-414-183-41	INDUCTOR 10uH	
L804	1-414-183-41	INDUCTOR 10uH	
L805	1-414-185-41	INDUCTOR 22uH	(AE, AP, CP, EI, IT, VP, UV)
L852	1-410-687-11	INDUCTOR 1.2mH	
L853	1-410-687-11	INDUCTOR 1.2mH	
		< TRANSISTOR >	
Q101	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q102	8-729-421-19	TRANSISTOR UN2213	
Q103	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q105	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q107	8-729-422-36	TRANSISTOR 2SB709A-Q	
Q201	8-729-424-56	TRANSISTOR UN211L	
Q301	8-729-421-19	TRANSISTOR UN2213	(B, VP)
Q303	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q304	8-729-422-36	TRANSISTOR 2SB709A-Q	
Q305	8-729-422-27	TRANSISTOR 2SD601A-Q	(B, VP)
Q306	8-729-424-18	TRANSISTOR UN2113	
Q501	8-729-422-36	TRANSISTOR 2SB709A-Q	(B, CP)
Q502	8-729-422-27	TRANSISTOR 2SD601A-Q	(B, CP)
Q601	8-729-421-19	TRANSISTOR UN2213	(B, VP)
Q602	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q604	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q605	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q606	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q607	8-729-421-19	TRANSISTOR UN2213	(B)
Q608	8-729-424-56	TRANSISTOR UN211L	
Q609	8-729-421-19	TRANSISTOR UN2213	
Q613	8-729-421-19	TRANSISTOR UN2213	
Q614	8-729-421-19	TRANSISTOR UN2213	(B, VP)
Q615	8-729-424-18	TRANSISTOR UN2113	
Q616	8-729-421-19	TRANSISTOR UN2213	

Ref. No.	Part No.	Description				Remark
Q617	8-729-422-36	TRANSISTOR	2SB709A-Q			
Q701	8-729-422-36	TRANSISTOR	2SB709A-Q			
Q702	8-729-424-56	TRANSISTOR	UN211L			
Q703	8-729-421-19	TRANSISTOR	UN2213			
Q704	8-729-422-36	TRANSISTOR	2SB709A-Q			
Q705	8-729-421-19	TRANSISTOR	UN2213			
Q801	8-729-173-38	TRANSISTOR	2SA733-K			
Q802	8-729-422-27	TRANSISTOR	2SD601A-Q			
Q803	8-729-422-27	TRANSISTOR	2SD601A-Q			
Q840	8-729-119-78	TRANSISTOR	2SC2785-HFE (B)			
Q841	8-729-119-78	TRANSISTOR	2SC2785-HFE (B)			
Q851	8-729-012-31	TRANSISTOR	2SC4040-TL2-Q			
Q852	8-729-012-31	TRANSISTOR	2SC4040-TL2-Q			
Q853	8-729-421-19	TRANSISTOR	UN2213			
Q854	8-729-424-08	TRANSISTOR	UN2111			
Q855	8-729-424-18	TRANSISTOR	UN2113			
Q890	8-729-119-78	TRANSISTOR	2SC2785-HFE			
		< RESISTOR >				
R101	1-216-119-00	METAL CHIP	820K	5%	1/10W	
R102	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R103	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R104	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R105	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R106	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R107	1-216-037-00	METAL CHIP	330	5%	1/10W	
R108	1-216-025-00	METAL CHIP	100	5%	1/10W	
R111	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R112	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R113	1-216-048-00	METAL CHIP	910	5%	1/10W	
R114	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R115	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R116	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R117	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R118	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R119	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R120	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R121	1-216-041-00	METAL CHIP	470	5%	1/10W	
R122	1-216-033-00	METAL CHIP	220	5%	1/10W	
R123	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R124	1-249-429-11	CARBON	10K	5%	1/4W	
R131	1-249-417-11	CARBON	1K	5%	1/4W	F
R132	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R201	1-216-295-00	METAL CHIP	0	5%	1/10W	
R202	1-216-295-00	METAL CHIP	0	5%	1/10W	
R203	1-249-429-11	CARBON	10K	5%	1/4W	
R204	1-249-429-11	CARBON	10K	5%	1/4W	
R205	1-249-429-11	CARBON	10K	5%	1/4W	
R206	1-249-436-11	CARBON	39K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R207	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R208	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R209	1-215-464-00	METAL	62K	1%	1/6W	
R210	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R211	1-216-661-11	METAL CHIP	2.7K	0.5%	1/10W	
R212	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R213	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R214	1-247-885-00	CARBON	180K	5%	1/4W	
R215	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R216	1-216-198-00	METAL CHIP	1K	5%	1/8W	
R217	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R218	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R219	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R220	1-249-431-11	CARBON	15K	5%	1/4W	
R222	1-249-422-11	CARBON	2.7K	5%	1/4W	F
R223	1-249-429-11	CARBON	10K	5%	1/4W	
R224	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R225	1-249-437-11	CARBON	47K	5%	1/4W	
R226	1-249-437-11	CARBON	47K	5%	1/4W	
R230	1-249-429-11	CARBON	10K	5%	1/4W	
R240	1-249-418-11	CARBON	1.2K	5%	1/4W	F
R301	1-216-073-00	METAL CHIP	10K	5%	1/10W	(B, VP)
R302	1-216-073-00	METAL CHIP	10K	5%	1/10W	(B, VP)
R303	1-216-033-00	METAL CHIP	220	5%	1/10W	
R304	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R305	1-216-295-00	METAL CHIP	0	5%	1/10W	
R306	1-216-295-00	METAL CHIP	0	5%	1/10W	
R307	1-216-043-00	METAL CHIP	560	5%	1/10W	
R308	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R309	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R310	1-216-043-00	METAL CHIP	560	5%	1/10W	
R311	1-249-429-11	CARBON	10K	5%	1/4W	
R312	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R313	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R314	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R315	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R316	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R503	1-216-022-00	METAL CHIP	75	5%	1/10W	(B, CP)
R504	1-249-417-11	CARBON	1K	5%	1/4W	F (B, CP)
R505	1-216-041-00	METAL CHIP	470	5%	1/10W	(B, CP)
R506	1-249-413-11	CARBON	470	5%	1/4W	F (B, CP)
R507	1-249-414-11	CARBON	560	5%	1/4W	F (B, CP)
R509	1-216-076-00	METAL CHIP	13K	5%	1/10W	(B, CP)
R510	1-216-075-00	METAL CHIP	12K	5%	1/10W	(B, CP)
R511	1-216-097-00	METAL CHIP	100K	5%	1/10W	(B, CP)
R512	1-216-097-00	METAL CHIP	100K	5%	1/10W	(B, CP)
R513	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	(B, CP)
R601	1-216-041-00	METAL CHIP	470	5%	1/10W	
R602	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	

Ref. No.	Part No.	Description				Remark
R603	1-249-417-11	CARBON	1K	5%	1/4W	F
R604	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R605	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R606	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R607	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R608	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R609	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R610	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R611	1-216-035-00	METAL CHIP	270	5%	1/10W	
R612	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R613	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R614	1-216-035-00	METAL CHIP	270	5%	1/10W	
R615	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R616	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R617	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R618	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R619	1-249-413-11	CARBON	470	5%	1/4W	F (B)
R620	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R621	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R625	1-249-417-11	CARBON	1K	5%	1/4W	F (VP)
R626	1-249-429-11	CARBON	10K	5%	1/4W	(B, VP)
R627	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R628	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R629	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R630	1-216-041-00	METAL CHIP	470	5%	1/10W	
R631	1-216-043-00	METAL CHIP	560	5%	1/10W	
R632	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R636	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R690	1-216-033-00	METAL CHIP	220	5%	1/10W	(VP)
R690	1-216-295-00	METAL CHIP	0	5%	1/10W	(AE, AP, B, CP, EI, IT, UV)
R691	1-249-401-11	CARBON	47	5%	1/4W	F (VP)
R692	1-249-401-11	CARBON	47	5%	1/4W	F (VP)
R693	1-249-409-11	CARBON	220	5%	1/4W	F (VP)
R701	1-249-408-11	CARBON	180	5%	1/4W	F (AE, AP, EI, IT, VP, UV)
R701	1-249-409-11	CARBON	220	5%	1/4W	F (B, CP)
R702	1-249-407-11	CARBON	150	5%	1/4W	F (AE, AP, EI, IT, VP, UV)
R702	1-249-408-11	CARBON	180	5%	1/4W	F (B, CP)
R703	1-216-021-00	METAL CHIP	68	5%	1/10W	
R704	1-216-022-00	METAL CHIP	75	5%	1/10W	
R705	1-216-049-00	METAL CHIP	1K	5%	1/10W	(B, CP)
R706	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R707	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R708	1-216-041-00	METAL CHIP	470	5%	1/10W	
R709	1-216-041-00	METAL CHIP	470	5%	1/10W	
R710	1-249-414-11	CARBON	560	5%	1/4W	F
R715	1-216-037-00	METAL CHIP	330	5%	1/10W	
R717	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R804	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R805	1-249-405-11	CARBON	100	5%	1/4W	F
R806	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R807	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R808	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R810	1-216-025-00	METAL CHIP	100	5%	1/10W	
R811	1-216-037-00	METAL CHIP	330	5%	1/10W	
R812	1-216-037-00	METAL CHIP	330	5%	1/10W	
R814	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R815	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R816	1-216-073-00	METAL CHIP	10K	5%	1/10W	(B)
R817	1-216-073-00	METAL CHIP	10K	5%	1/10W	(B)
R819	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	(EI, UV)
R819	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(AE, AP, CP, IT, VP)
R820	1-216-049-00	METAL CHIP	1K	5%	1/10W	(B)
R821	1-216-049-00	METAL CHIP	1K	5%	1/10W	(B)
R825	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	(AE, AP, CP, EI, IT, VP, UV)
R825	1-216-295-00	METAL CHIP	0	5%	1/10W	(B)
R830	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	(AE, AP, CP, EI, IT, VP, UV,)
R838	1-216-190-00	METAL GLAZE	470	5%	1/8W	(VP)
R838	1-216-296-00	METAL CHIP	0	5%	1/8W	(AE, AP, B, CP, EI, IT, UV)
R866	1-216-001-00	METAL CHIP	10	5%	1/10W	
R868	1-216-081-00	METAL CHIP	22K	5%	1/10W	
⚠R869	1-249-395-11	CARBON	15	5%	1/4W	F
R870	1-216-083-00	METAL CHIP	27K	5%	1/10W	
⚠R871	1-249-394-11	CARBON	12	5%	1/6W	F
R898	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R899	1-216-049-00	METAL CHIP	1K	5%	1/10W	

< RF MODULATOR >

⚠RF701	1-466-328-11	MODULATOR, RF (RFU-2017)	(AE, AP, CP, IT, VP)
⚠RF701	1-466-348-11	MODULATOR, RF (RFU-2023)	(B)
⚠RF701	1-466-347-11	MODULATOR, RF (RFU-2024)	(EI, UV)

< VARIABLE RESISTOR >

RV202	1-238-019-11	RES, ADJ, CARBON 47K
RV851	1-238-020-11	RES, ADJ, CARBON 100K

< TRANSFORMER >

T851	1-423-413-11	TRANSFORMER, BIAS OSCILLATION
T852	1-423-415-11	TRANSFORMER, BIAS OSCILLATION

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.

MA-144 MD-56

Ref. No.	Part No.	Description			Remark
		< TUNER >			
⚠TU801	1-465-744-11	TUNER, VIF (BTF-2U601) (UV)			
⚠TU801	1-465-745-11	TUNER, VIF (BTF-2C401) (VP)			
⚠TU801	1-465-746-11	TUNER, VIF (BTF-2C402) (AE, AP, CP, IT)			
⚠TU801	1-465-747-11	TUNER, VIF (BTF-2C403) (EI)			
⚠TU801	1-693-205-11	TUNER (BTF-3C402) (B)			
		< VIBRATOR >			
X201	1-578-774-11	VIBRATOR, CRYSTAL (12MHz)			
X301	1-577-289-11	VIBRATOR, CRYSTAL (17.1MHz)			
X302	1-577-165-11	VIBLATOR, CERAMIC (500KHz)			
**********					
*	A-6754-472-A	MD-56 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C001	1-161-494-00	CERAMIC	0.022uF		25V
C002	1-161-494-00	CERAMIC	0.022uF		25V
C003	1-126-157-11	ELECT	10uF	20%	16V
C004	1-161-379-00	CERAMIC	0.01uF	20%	25V
C006	1-124-589-11	ELECT	47uF	20%	16V
C008	1-164-159-11	CERAMIC	0.1uF		50V
C009	1-164-159-11	CERAMIC	0.1uF		50V
C022	1-161-379-00	CERAMIC	0.01uF	20%	25V
C025	1-162-294-31	CERAMIC	0.001uF	10%	50V
C026	1-162-294-31	CERAMIC	0.001uF	10%	50V
C050	1-126-163-11	ELECT	4.7uF	20%	50V
C051	1-126-163-11	ELECT	4.7uF	20%	50V
C052	1-126-163-11	ELECT	4.7uF	20%	50V
C053	1-126-157-11	ELECT	10uF	20%	16V
C054	1-126-096-11	ELECT	10uF	20%	35V
C055	1-164-159-11	CERAMIC	0.1uF		50V
C056	1-164-159-11	CERAMIC	0.1uF		50V
C057	1-164-159-11	CERAMIC	0.1uF		50V
C058	1-162-852-11	CERAMIC	0.15uF	10%	16V
C059	1-162-851-11	CERAMIC	0.1uF	10%	16V
C060	1-126-157-11	ELECT	10uF	20%	16V
		< CONNECTOR >			
CN001	1-564-726-11	PIN HEADER, ANGLE 10P			
CN002	1-569-335-11	CONNECTOR, BOARD TO BOARD 9P			
CN003	1-691-643-11	CONNECTOR, BOARD TO BOARD			
CN004	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
CN005	1-506-482-11	PIN, CONNECTOR 3P			
CN006	1-569-333-11	CONNECTOR, BOARD TO BOARD 3P			
CN007	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			

Ref. No.	Part No.	Description					Remark
		< DIODE >					
D001	8-719-985-00	DIODE	GL451VS1				
D004	8-719-109-93	DIODE	RD6.2ES-B2				
D005	8-719-109-93	DIODE	RD6.2ES-B2				
D006	8-719-109-93	DIODE	RD6.2ES-B2				
D007	8-719-109-93	DIODE	RD6.2ES-B2				
		< IC >					
IC001	8-759-420-83	IC	AN3814K				
IC002	8-759-912-77	IC	uPC324C				
IC003	8-759-987-16	IC	LM393P				
		< PHOTO INTERRUPTER >					
PH001	8-759-144-33	IC	PS6002				
PH002	8-759-144-33	IC	PS6002				
		< TRANSISTOR >					
Q001	8-729-926-31	TRANSISTOR	PT483F1S				
Q002	8-729-926-31	TRANSISTOR	PT483F1S				
		< RESISTOR >					
R001	1-249-423-11	CARBON	3.3K	5%	1/4W	F	
R002	1-249-423-11	CARBON	3.3K	5%	1/4W	F	
R003	1-249-426-11	CARBON	5.6K	5%	1/4W		
R004	1-249-426-11	CARBON	5.6K	5%	1/4W		
R005	1-249-417-11	CARBON	1K	5%	1/4W	F	
R006	1-249-441-11	CARBON	100K	5%	1/4W		
R007	1-249-441-11	CARBON	100K	5%	1/4W		
R008	1-249-425-11	CARBON	4.7K	5%	1/4W	F	
R009	1-249-408-11	CARBON	180	5%	1/4W	F	
R010	1-249-422-11	CARBON	2.7K	5%	1/4W	F	
R011	1-249-437-11	CARBON	47K	5%	1/4W		
R012	1-249-421-11	CARBON	2.2K	5%	1/4W	F	
R015	1-249-437-11	CARBON	47K	5%	1/4W		
R016	1-249-421-11	CARBON	2.2K	5%	1/4W	F	
R017	1-249-429-11	CARBON	10K	5%	1/4W		
R018	1-249-429-11	CARBON	10K	5%	1/4W		
R019	1-249-429-11	CARBON	10K	5%	1/4W		
R020	1-249-429-11	CARBON	10K	5%	1/4W		
R023	1-249-414-11	CARBON	560	5%	1/4W	F	
R050	1-249-395-11	CARBON	15	5%	1/4W	F	
R051	1-249-395-11	CARBON	15	5%	1/4W	F	
R052	1-249-395-11	CARBON	15	5%	1/4W	F	
R053	1-249-418-11	CARBON	1.2K	5%	1/4W	F	
R054	1-216-347-11	METAL OXIDE	0.68	5%	1W	F	
R055	1-249-437-11	CARBON	47K	5%	1/4W		
R056	1-249-430-11	CARBON	12K	5%	1/4W		
R057	1-249-430-11	CARBON	12K	5%	1/4W		

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
R058	1-249-429-11	CARBON	10K	5%	1/4W
R059	1-249-429-11	CARBON	10K	5%	1/4W
		< SWITCH >			
S001	1-570-953-11	SWITCH, PUSH (1 KEY) (C-U/D)			
S002	1-570-953-11	SWITCH, PUSH (1 KEY) (REC PRF)			
**********					
*	A-6754-516-A	MF-171 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C202	1-162-282-31	CERAMIC	100PF	10%	50V
C204	1-162-282-31	CERAMIC	100PF	10%	50V
		< CONNECTOR >			
* CN201	1-691-407-11	CONNECTOR, BOARD TO BOARD 10P			
		< DIODE >			
D201	8-719-940-82	LED SLR34MC3			
D202	8-719-940-82	LED SLR34MC3			
D203	8-719-940-99	LED SLR34VC3			
D205	8-719-109-93	DIODE RD6.2ES-B2			
		< IC >			
IC201	1-466-833-11	IC RAY-CATCHER BLOCK, REMOCON			
		< COIL >			
L202	1-410-336-11	INDUCTOR 220uH			
		< JACK >			
PJ201	1-695-863-11	JACK, PIN 2P (LINE IN 2)			
		< TRANSISTOR >			
Q201	8-729-421-19	TRANSISTOR UN2213			
Q202	8-729-422-36	TRANSISTOR 2SB709A-Q			
		< RESISTOR >			
R201	1-216-089-00	METAL CHIP	47K	5%	1/10W
R202	1-216-022-00	METAL CHIP	75	5%	1/10W
R203	1-216-041-00	METAL CHIP	470	5%	1/10W
R204	1-216-041-00	METAL CHIP	470	5%	1/10W
R205	1-216-021-00	METAL CHIP	68	5%	1/10W
R206	1-216-031-00	METAL CHIP	180	5%	1/10W
R207	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R210	1-216-295-00	METAL CHIP	0	5%	1/10W

Ref. No.	Part No.	Description			Remark
		< SWITCH >			
S201	1-571-977-11	SWITCH, TACTIL (ON/STANDBY)			
S202	1-571-977-11	SWITCH, TACTIL (EJECT)			
**********					
*	A-6782-000-A	MF-172 BOARD, COMPLETE (AE, AP, IT)			
		**********			
*	A-6782-008-A	MF-172 BOARD, COMPLETE (EI)			
		**********			
*	A-6782-010-A	MF-172 BOARD, COMPLETE (B)			
		**********			
*	A-6782-012-A	MF-172 BOARD, COMPLETE (CP)			
		**********			
*	A-6782-014-A	MF-172 BOARD, COMPLETE (VP)			
		**********			
*	A-6782-017-A	MF-172 BOARD, COMPLETE (UV)			
		**********			
		< BUZZER >			
BZ101	1-529-104-11	BUZZER, PIEZOELECTRIC			
		< CAPACITOR >			
C101	1-128-057-11	ELECT	330uF	20%	6.3V
C102	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C103	1-125-486-11	DOUBLE LAYERS	0.22F		5.5V
C104	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C105	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C106	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C107	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C108	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C109	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C110	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C111	1-124-261-00	ELECT	10uF	20%	50V
C112	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C113	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C114	1-161-329-00	CERAMIC	0.0068uF	20%	16V
		< CONNECTOR >			
CN101	1-568-079-11	CONNECTOR (RECEPTALE) 20P			
CN102	1-568-079-11	CONNECTOR (RECEPTALE) 20P			
CN103	1-695-947-11	CONNECTOR, BOARD TO BOARD 10P			
CN104	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
		< DIODE >			
D101	8-719-911-19	DIODE 1SS119			
D102	8-719-911-19	DIODE 1SS119			
D104	8-719-110-08	DIODE RD8.2ES-B2			
D107	8-719-200-82	DIODE 11ES2			

MF-172 MF-173

Ref. No.	Part No.	Description				Remark
		< FILTER >				
FL101	1-517-132-11	INDICATOR TUBE, FLUORESCENT (AE, AP, CP, EI, IT, VP, UV)				
FL101	1-517-133-11	INDICATOR TUBE, FLUORESCENT (B)				
		< IC >				
IC101	8-759-172-62	IC MB89095-116				
IC102	8-759-501-99	IC ST93C46AB1				
IC103	8-759-520-98	IC PST572K				
IC104	8-759-510-43	IC PST572C				
		< JUMPER RESISTOR >				
JR101	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR104	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR111	1-216-295-00	METAL CHIP	0	5%	1/10W	
		< COIL >				
L101	1-410-509-11	INDUCTOR 10uH				
		< RESISTOR >				
R101	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R102	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R103	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R104	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R106	1-216-057-00	METAL CHIP (AE, AP, IT)	2.2K	5%	1/10W	
R106	1-216-075-00	METAL CHIP	12K	5%	1/10W	(CP)
R106	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(VP)
R106	1-216-081-00	METAL CHIP	22K	5%	1/10W	(EI)
R106	1-216-089-00	METAL CHIP	47K	5%	1/10W	(B)
R106	1-216-295-00	METAL CHIP	0	5%	1/10W	(UV)
R107	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R108	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R109	1-216-033-00	METAL CHIP	220	5%	1/10W	
R110	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R111	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R112	1-216-073-00	METAL CHIP	10K	5%	1/10W	(B, CP)
R113	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R114	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R115	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R116	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R117	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R118	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R119	1-216-198-00	METAL CHIP	1K	5%	1/8W	
R120	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R121	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R122	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R123	1-216-295-00	METAL CHIP	0	5%	1/10W	
R124	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(B, CP)
R125	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(B, CP)
R126	1-216-041-00	METAL CHIP	470	5%	1/10W	
R127	1-216-041-00	METAL CHIP	470	5%	1/10W	
R128	1-216-295-00	METAL CHIP	0	5%	1/10W	
R129	1-249-429-11	CARBON	10K	5%	1/4W	
R130	1-216-198-00	METAL CHIP	1K	5%	1/8W	
R131	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R132	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R133	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R134	1-249-417-11	CARBON	1K	5%	1/4W	F
R135	1-249-417-11	CARBON	1K	5%	1/4W	F
R136	1-216-041-00	METAL CHIP	470	5%	1/10W	
		< VIBRATOR >				
X101	1-579-463-11	VIBRATOR, CRYSTAL (32.768KHz)				
X102	1-579-175-11	VIBRATOR, CERAMIC (10MHz)				
**********						
*	A-6782-001-A	MF-173 BOARD, COMPLETE (EXCEPT, ********** AP, VP, UV) *********				
*	A-6782-015-A	MF-173 BOARD, COMPLETE (AP, VP, UV) **********				
		< CAPACITOR >				
C001	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
		< CONNECTOR >				
CN001	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P				
CN002	1-580-850-11	CONNECTOR (DMS) 8P				
		< DIODE >				
D002	8-719-940-99	LED SLR34VC3 (TIMER REC: EXCEPT E5B) (ENR PROG: E5B)				
D003	8-719-940-99	LED SLR34VC3 (REC: EXCEPT E5B) (ENR: E5B)				
D004	8-719-812-32	LED TLY123 (FF: EXCEPT E5B) (◀◀: E5B)				
D005	8-719-940-82	LED SLR34MC3 (FORWARD: EXCEPT E5B) (AVANCE: E5B)				
D006	8-719-946-30	LED SLR34DC3 (PAUSE)				
D007	8-719-940-82	LED SLR34MC3 (REVERSE: EXCEPT E5B) (RETOUR: E5B)				
D008	8-719-812-32	LED TLY123 (REW: EXCEPT E5B) (▶▶: E5B)				
D009	8-719-812-32	LED TLY123 (HI-SPEED REWIND: EXCEPT E5B) (REMBOB REPAIDE: E5B)				
D010	8-719-940-99	LED SLR34VC3 (AUDIO DUB: EXCEPT E5B) (DOUBLAGE SON: E5B)				
D012	8-719-946-30	LED SLR34DC3 (OPC)				

Ref. No.	Part No.	Description			Remark
		< JUMPER RESISTOR >			
JR031	1-216-296-00	METAL CHIP	0	5% 1/8W	
JR032	1-216-296-00	METAL CHIP	0	5% 1/8W	
JR033	1-216-296-00	METAL CHIP	0	5% 1/8W	
JR034	1-216-296-00	METAL CHIP	0	5% 1/8W	
JR035	1-216-295-00	METAL CHIP	0	5% 1/10W	
JR036	1-216-296-00	METAL CHIP	0	5% 1/8W	
JR037	1-216-295-00	METAL CHIP	0	5% 1/10W	
JR038	1-216-296-00	METAL CHIP	0	5% 1/8W	
		< TRANSISTOR >			
Q001	8-729-421-19	TRANSISTOR	UN2213		
Q002	8-729-421-19	TRANSISTOR	UN2213		
Q003	8-729-421-19	TRANSISTOR	UN2213		
Q004	8-729-421-19	TRANSISTOR	UN2213		
Q005	8-729-421-19	TRANSISTOR	UN2213		
Q006	8-729-421-19	TRANSISTOR	UN2213		
Q007	8-729-421-19	TRANSISTOR	UN2213		
Q009	8-729-421-19	TRANSISTOR	UN2213		
		< RESISTOR >			
R001	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R002	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R003	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R004	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R005	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R006	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R007	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R008	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R009	1-216-065-00	METAL CHIP	4.7K	5% 1/10W	
R010	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R011	1-216-081-00	METAL CHIP	22K	5% 1/10W	(AP, VP, UV)
R012	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R013	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R014	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R015	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R016	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R018	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R019	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R020	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R021	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R024	1-216-035-00	METAL CHIP	270	5% 1/10W	
R025	1-216-035-00	METAL CHIP	270	5% 1/10W	
R026	1-216-031-00	METAL CHIP	180	5% 1/10W	
R027	1-216-031-00	METAL CHIP	180	5% 1/10W	
R028	1-216-037-00	METAL CHIP	330	5% 1/10W	
R029	1-216-031-00	METAL CHIP	180	5% 1/10W	
R030	1-216-031-00	METAL CHIP	180	5% 1/10W	
R031	1-216-031-00	METAL CHIP	180	5% 1/10W	
R032	1-216-037-00	METAL CHIP	330	5% 1/10W	
R034	1-216-035-00	METAL CHIP	270	5% 1/10W	
R035	1-216-075-00	METAL CHIP	12K	5% 1/10W	
		< SWITCH >			
S001	1-571-977-11	SWITCH, TACTIL (REC: EXCEPT E5B) (ENR: E5B)			
S002	1-571-977-11	SWITCH, TACTIL (INPUT SELECT: EXCEPT E5B) (CHOIX ENTREE: E5B)			
S003	1-571-977-11	SWITCH, TACTIL (PROGRAM +: EXCEPT E5B) (CHAIN +: E5B)			
S004	1-571-977-11	SWITCH, TACTIL (PROGRAM -: EXCEPT E5B) (CHAIN -: E5B)			
S005	1-571-977-11	SWITCH, TACTIL (PDC) (AP, VP, UV)			
S006	1-571-977-11	SWITCH, TACTIL (PAUSE)			
S007	1-571-977-11	SWITCH, TACTIL (HI-SPEED REWIND: EXCEPT E5B) (REMBOB RAPIDE :E5B)			
S008	1-571-977-11	SWITCH, TACTIL (TIMER REC: EXCEPT E5B) (ENR PROG: E5B)			
S009	1-572-907-11	SWITCH, SLIDE (PICTURE: EXCEPT E5B) (IMAGE: E5B)			
S010	1-572-907-11	SWITCH, SLIDE (COLOR SYSTEM: EXCEPT E5B) (SYSTEM COULEUR: E5B)			
S011	1-692-381-11	SWITCH, SLIDE (NTSC PB: EXCEPT E5B) (LECTURE NTSC: E5B)			
S012	1-571-977-11	SWITCH, TACTIL (OPC)			
S901	1-572-662-11	SWITCH, ROTARY (DUAL MODE SHUTTLE)			
**********					
*	A-6755-956-A	PD-37 BOARD, COMPLETE (AP, UV) **********			
		< CAPACITOR >			
C003	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C004	1-124-589-11	ELECT	47uF	20% 16V	
C005	1-163-227-11	CERAMIC CHIP	10PF	0.5PF 50V	
C006	1-163-227-11	CERAMIC CHIP	10PF	0.5PF 50V	
C007	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C008	1-124-589-11	ELECT	47uF	20% 16V	
C009	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C010	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C011	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C012	1-126-301-11	ELECT	1uF	20% 50V	
C014	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
		< CONNECTOR >			
* CN001	1-565-438-11	SOCKET, CONNECTOR (PCB) 10P			

PD-37 POWER BLOCK

Ref. No.	Part No.	Description			Remark
		< DIODE >			
D001	8-719-801-48	DIODE 1SS193			
D002	8-719-801-48	DIODE 1SS193			
D003	8-719-911-19	DIODE 1SS119			
D004	8-719-911-19	DIODE 1SS119			
		< IC >			
IC001	8-752-843-10	IC CXP80316-021Q			
IC002	8-759-168-94	IC MV1820E-CG-MPEE			
IC003	8-759-504-44	IC MM1031XMR			
		< JUMPER RESISTOR >			
JR001	1-216-295-00	METAL CHIP	0	5% 1/10W	
JR002	1-216-296-00	METAL CHIP	0	5% 1/8W	
		< COIL >			
L001	1-410-521-11	INDUCTOR 100uH			
L002	1-410-509-11	INDUCTOR 10uH			
		< RESISTOR >			
R001	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R002	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R003	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R004	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R005	1-216-073-00	METAL CHIP	10K	5% 1/10W	
		< VIBRATOR >			
X001	1-579-125-11	VIBRATOR, CERAMIC (8MHz)			
X002	1-579-971-11	VIBRATOR, CRYSTAL (27.5MHz)			
**********					
⚠	1-413-789-11	POWER BLOCK (AE, AP, B, CP, EI, IT, VP)			
		**********			
⚠	1-413-790-11	POWER BLOCK (UV)			
		**********			
		< CAPACITOR >			
⚠C101	9-902-933-01	MATAL FILM	0.22uF		250V
⚠C102	9-902-934-01	MATAL FILM	0.1uF		250V
⚠C103	9-904-183-01	CERAMIC	1000PF		
⚠C104	9-904-183-01	CERAMIC	1000PF		
⚠C105	9-904-183-01	CERAMIC	1000PF		
⚠C106	9-904-183-01	CERAMIC	1000PF		
⚠C107	9-902-936-01	CERAMIC	4700PF		
⚠C108	9-902-936-01	CERAMIC	4700PF		
⚠C109	9-902-936-01	CERAMIC	4700PF		
⚠C110	9-904-184-01	ELECT	68uF		400V
C111	9-904-185-01	ELECT	1uF		100V

Ref. No.	Part No.	Description			Remark
C112	9-902-055-01	CERAMIC	100PF		1KV
⚠C113	9-900-525-01	METAL FILM	0.047uF		400V
C114	1-130-491-51	FILM	0.047uF		50V
C115	1-130-491-51	FILM	0.047uF		50V
C201	1-126-964-51	ELECT	10uF		50V
C202	1-126-768-51	ELECT	2200uF		16V
C203	1-126-933-51	ELECT	100uF		16V
C204	1-126-927-51	ELECT	2200uF		10V
C205	1-124-472-11	ELECT	470uF		10V
C206	1-126-925-51	ELECT	100uF		50V
C207	1-126-916-51	ELECT	1000uF		6.3V
C208	1-126-960-51	ELECT	1uF		50V
C210	1-130-483-51	FILM	0.01uF		50V
C211	1-130-483-51	FILM	0.01uF		50V
		< CONNECTOR >			
CN1	1-568-787-11	CONNECTOR 10P			
CN2	1-568-786-12	CONNECTOR 9P			
⚠CN101	9-904-187-01	CONNECTOR 2P (AC IN)			
		< DIODE >			
⚠D101	9-900-511-01	BRIDGE DIODE S1WBA60			
⚠D102	9-900-513-01	DIODE EG01C			
⚠D103	8-719-200-82	DIODE 11ES2			
⚠D104	8-719-109-61	ZENER DIODE RD3.0ES			
⚠D105	9-900-514-01	DIODE MA165			
⚠D106	9-902-050-01	DIODE ERA15-06			
D201	9-900-534-01	DIODE ERA18-02			
⚠D202	9-902-061-01	DIODE RG4Z			
⚠D203	8-719-200-82	DIODE 11ES2			
⚠D204	8-719-981-00	DIODE RK34			
D206	9-900-534-01	DIODE ERA18-02			
⚠D207	9-902-064-01	DIODE ERA81-004			
⚠D208	9-903-933-01	ZENER DIODE RD15F			
		< FUSE >			
⚠F101	1-532-388-51	FUSE (250V 2A)			
		< FERRITE BEAD >			
⚠FB-1	9-902-053-01	BEADS CORE			
		< IC >			
⚠IC201	9-900-533-01	IC HA17431P			
		< COIL >			
⚠L101	9-904-182-01	LINE FILTER			
L202	9-902-762-01	CHOKE COIL 20uH			
L203	9-902-762-01	CHOKE COIL 20uH			

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description			Remark
		< TRANSISTOR >			
⚠Q101	9-904-179-01	TRANSISTOR	2SC4231		
⚠Q102	9-900-517-01	TRANSISTOR	2SC3377		
		< RESISTOR >			
⚠R101	9-902-945-01	CARBON	1M	1/2W	F
R102	1-247-883-31	CARBON	150K	1/4W	
R103	1-247-883-31	CARBON	150K	1/4W	
R104	1-247-863-31	CARBON	22K	1/4W	
⚠R105	9-904-186-01	CEMENT	4.7	2W	
⚠R106	9-902-942-01	METAL OXIDE FILM	68K	3W	
⚠R107	1-247-739-51	CARBON	100	1/2W	F
⚠R108	1-247-739-51	CARBON	100	1/2W	F
R109	1-247-827-31	CARBON	(680)	1/2W(FOR ADJUSTMENT)	
R110	1-247-883-31	CARBON	150K	1/4W	
⚠R201	1-247-727-11	CARBON	10	1/2W	F
⚠R202	1-247-727-11	CARBON	10	1/2W	F
⚠R203	1-212-857-51	FUSE	10	1/4W	F
⚠R204	9-902-074-01	FUSE	0.47	1/4W	F
R205	1-244-841-11	CARBON	47	1/2W	
R206	1-215-428-11	METAL FILM	2K	1/4W	
R207		CARBON (FOR ADJUSTMENT)			
R208	1-215-425-31	METAL FILM	(1.5K)	1/4W (FOR ADJUSTMENT)	
		< VARIABLE RESISTOR >			
RV201	9-902-761-01	RES, ADJ, METAL	200		
		< TRANSFORMER >			
⚠T101	9-904-181-01	SWITCHING TRANSFORMER			
**********					
*	A-6727-490-A	RP-163 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C801	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C802	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C803	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C804	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C805	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C806	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C807	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C808	1-124-584-00	ELECT	100uF	20%	10V
C809	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C810	1-124-584-00	ELECT	100uF	20%	10V
C811	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C812	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C813	1-164-336-11	CERAMIC CHIP	0.33uF		25V
C814	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C815	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C816	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C817	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C818	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C819	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C820	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C821	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C822	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C823	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C824	1-124-589-11	ELECT	47uF	20%	16V
C826	1-124-589-11	ELECT	47uF	20%	16V
C827	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C831	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C834	1-163-088-00	CERAMIC CHIP	5PF		50V
C835	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C839	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C840	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C841	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C842	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C843	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C850	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C851	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C852	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C853	1-163-031-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
CN801	1-695-486-11	CONNECTOR, BOARD TO BOARD 10P			
CN802	1-506-490-21	PIN, CONNECTOR 11P			
* CN803	1-564-018-51	PIN, CONNECTOR 8P			
* CN804	1-564-028-00	PIN, CONNECTOR 3P			
		< DIODE >			
D801	8-719-400-18	DIODE	MA152WK		
D802	8-719-400-18	DIODE	MA152WK		
D803	8-719-400-18	DIODE	MA152WK		
D804	8-719-400-18	DIODE	MA152WK		
D805	8-719-400-18	DIODE	MA152WK		
D806	8-719-400-18	DIODE	MA152WK		
		< IC >			
IC801	8-759-046-75	IC	HA118162NT		
		< COIL >			
L801	1-410-525-11	INDUCTOR	220uH		
L802	1-410-525-11	INDUCTOR	220uH		
L803	1-410-521-11	INDUCTOR	100uH		
L804	1-410-521-11	INDUCTOR	100uH		

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

RP-163 **VP-32**

Ref. No.	Part No.	Description				Remark
L806	1-410-515-11	INDUCTOR 33uH				
L807	1-410-516-11	INDUCTOR 39uH				
L808	1-410-511-11	INDUCTOR 15uH				
L809	1-410-511-11	INDUCTOR 15uH				
L810	1-410-524-41	INDUCTOR 180uH				
L811	1-410-521-11	INDUCTOR 100uH				
L812	1-410-521-11	INDUCTOR 100uH				
L850	1-410-509-11	INDUCTOR 10uH				
		< TRANSISTOR >				
Q802	8-729-422-27	TRANSISTOR	2SD601A-Q			
Q803	8-729-901-06	TRANSISTOR	DTA144EK			
Q804	8-729-422-27	TRANSISTOR	2SD601A-Q			
Q805	8-729-422-37	TRANSISTOR	2SB709A-R			
Q806	8-729-422-37	TRANSISTOR	2SB709A-R			
Q807	8-729-422-27	TRANSISTOR	2SD601A-Q			
Q808	8-729-421-19	TRANSISTOR	UN2213			
Q809	8-729-422-27	TRANSISTOR	2SD601A-Q			
Q810	8-729-421-19	TRANSISTOR	UN2213			
Q811	8-729-301-98	TRANSISTOR	2SB1000A-L			
Q813	8-729-421-19	TRANSISTOR	UN2213			
Q814	8-729-421-19	TRANSISTOR	UN2213			
Q815	8-729-216-22	TRANSISTOR	2SA1162			
Q816	8-729-422-27	TRANSISTOR	2SD601A-Q			
Q817	8-729-216-22	TRANSISTOR	2SA1162			
Q818	8-729-216-22	TRANSISTOR	2SA1162			
Q821	8-729-421-19	TRANSISTOR	UN2213			
Q822	8-729-421-19	TRANSISTOR	UN2213			
		< RESISTOR >				
R801	1-216-023-00	METAL CHIP	82	5%	1/10W	
R802	1-216-043-00	METAL CHIP	560	5%	1/10W	
R806	1-216-023-00	METAL CHIP	82	5%	1/10W	
R807	1-216-023-00	METAL CHIP	82	5%	1/10W	
R808	1-216-023-00	METAL CHIP	82	5%	1/10W	
R809	1-216-021-00	METAL CHIP	68	5%	1/10W	
R810	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R811	1-216-043-00	METAL CHIP	560	5%	1/10W	
R812	1-216-023-00	METAL CHIP	82	5%	1/10W	
R813	1-216-047-00	METAL CHIP	820	5%	1/10W	
R815	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R816	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R817	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R818	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R819	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R820	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R821	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R822	1-216-039-00	METAL CHIP	390	5%	1/10W	
R823	1-216-047-00	METAL CHIP	820	5%	1/10W	
R824	1-216-039-00	METAL CHIP	390	5%	1/10W	
R825	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R826	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R827	1-216-045-00	METAL CHIP	680	5%	1/10W	
R828	1-216-043-00	METAL CHIP	560	5%	1/10W	
R829	1-216-047-00	METAL CHIP	820	5%	1/10W	
R830	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R831	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R832	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R833	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R834	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R838	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R839	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R840	1-216-309-00	METAL CHIP	5.6	5%	1/10W	
R841	1-216-045-00	METAL CHIP	680	5%	1/10W	
R842	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R843	1-216-011-00	METAL CHIP	27	5%	1/10W	
R848	1-216-295-00	METAL CHIP	0	5%	1/10W	
R849	1-216-043-00	METAL CHIP	560	5%	1/10W	
R850	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R854	1-249-409-11	CARBON	220	5%	1/4W	F

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* A-6754-476-A VP-32 BOARD, COMPLETE (VP)

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< CAPACITOR >

C901	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C902	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C904	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C906	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V	
C910	1-163-121-00	CERAMIC CHIP	150PF	5%	50V	

< CONNECTOR >

* CN901	1-695-948-11	CONNECTOR, BOARD TO BOARD 10P	

< DIODE >

D901	8-719-911-19	DIODE	1SS119

< IC >

IC901	8-759-030-60	IC	SDA5642
IC902	8-759-147-30	IC	uPD75004GB-VSX182

Ref. No.	Part No.	Description	Remark
		< COIL >	
L941	1-410-509-11	INDUCTOR 10uH	
		< RESISTOR >	
R901	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R902	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R903	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R904	1-216-119-00	METAL CHIP 820K 5% 1/10W	
R905	1-216-025-00	METAL CHIP 100 5% 1/10W	
R906	1-216-119-00	METAL CHIP 820K 5% 1/10W	
R907	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R908	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R910	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R911	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R912	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R913	1-216-073-00	METAL CHIP 10K 5% 1/10W	
		< VIBRATOR >	
X901	1-577-101-11	VIBRATOR, CERAMIC (4.19MHz)	

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MISCELLANEOUS
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30	1-466-935-21	REMOTE COMMANDER (RMT-AG1) (UV)	
260	1-543-647-11	HEAD, FE	
290	1-550-870-11	DRUM ASSY, ROTARY BOTTOM (DZL-59A-R)	
291	1-550-869-11	DRUM ASSY, ROTARY UPPER (DZR-59-R)	
M902	8-835-489-01	MOTOR, DC U-26K	
M903	X-3733-302-1	MOTOR ASSY, CAM	
M904	X-3727-784-1	MOTOR ASSY	
S1	1-692-062-11	SWITCH, ROTARY	

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ACCESSORIES & PACKING MATERIALS
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24	1-466-918-21	REMOTE COMMANDER (RMT-V131A) (AE, AP, CP, EI, IT, VP, UV)	
24	1-466-918-41	REMOTE COMMANDER (RMT-V131C) (B)	
⚠	1-574-056-11	CORD, POWER (VP)	
⚠	1-574-131-21	CORD, POWER SUPPLY (AE, AP, B, CP, EI, IT)	
⚠	1-590-865-11	CORD, POWER (UV)	
	1-696-593-11	CORD, CONNECTION (PAL) (AE, AP, CP, EI, IT, VP, UV)	
	1-696-905-11	CORD, CONNECTION (B)	
	3-695-308-01	DRIVER, VOLUME	
	3-755-994-11	MANUAL, INSTRUCTION (English) (EI, UV)	
	3-755-994-41	MANUAL, INSTRUCTION (Italian) (AE, IT)	
	3-755-994-51	MANUAL, INSTRUCTION (French, German, Italian) (VP)	
	3-755-994-61	MANUAL, INSTRUCTION (French) (B)	
*	3-755-994-71	MANUAL, INSTRUCTION (Spanish) (C)	
	3-755-994-81	MANUAL, INSTRUCTION (Dutch, French, German) (AE)	
	3-755-994-91	MANUAL, INSTRUCTION (Swedish, Danish, Portuguese) (AE)	
	3-756-916-11	MANUAL, INSTRUCTION (UV)	
	3-756-999-11	MANUAL, INSTRUCTION (Dutch) (AP)	
*	3-951-057-21	INDIVIDUAL CARTON (AE, AP, CP, EI, IT, VP)	
*	3-951-057-31	INDIVIDUAL CARTON (B, EI)	
*	3-951-057-51	INDIVIDUAL CARTON (UV)	
*	3-951-060-01	CUSHION (UPPER)	
*	3-951-061-01	CUSHION (LOWER)	

****

HARDWARE LIST
****

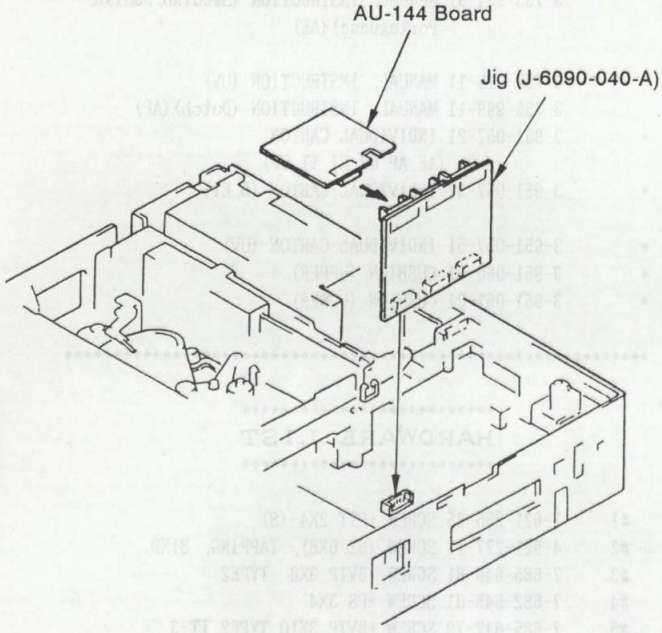
#1	7-621-255-25	SCREW +PTT 2X4 (S)
#2	4-921-277-11	SCREW (B2.6X8), TAPPING, BIND
#3	7-685-646-81	SCREW +BVTP 3X8 TYPE2
#4	7-682-645-01	SCREW +PS 3X4
#5	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3
#6	7-682-548-04	SCREW +P 3X8
#7	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
#8	7-621-732-08	SCREW
#10	7-628-254-05	SCREW +PS 2.6X5
#11	7-624-102-04	STOP RING 1.5, TYPE -E
#12	7-685-648-79	SCREW +BVTP 3X12 TYPE2
#13	7-682-546-04	SCREW +P 3X5

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.

SECTION 7
ELECTRICAL ADJUSTMENTS

During the adjustment, see the Parts Arrangement Diagram relevant to the adjustments on Page 139.

- When checking AU-144 board, use the translation board jig (J-6090-040-A).



7-1. PRE-ADJUSTMENT PREPARATIONS

Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

7-1-1. Instruments to be Used

Color TV

2) Oscilloscope 1 or 2 phenomena, band more than 30 MHz, delay mode, as provided.
3) Frequency counter (min. 8 digits)
4) PAL pattern generator
5) Digital voltmeter
6) Audio level meter
7) Audio generator
8) Attenuator
9) Distortion factor meter
10) Voice multiple signal generator
11) Alignment tape
    Part Code: H7099052H (MH-2)
12) HiFi alignment tape

7-1-2. Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

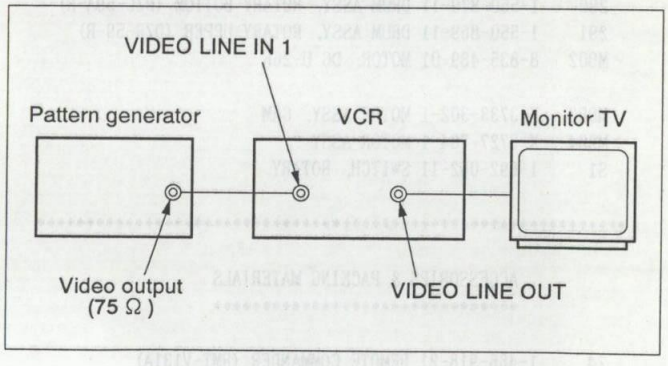


Fig. 7-1.

7-1-3. Set-up Adjustment

In this adjustment, PAL pattern generator is connected with LINE 1 input signal terminal. When check to tuner, connected AERIAL terminal. Check that the amplitudes of video signal SYNC signal, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3 V, respectively, and that the level ratio of the burst sigal and "red" signal are 0.30 : 0.66. Fig. 7-2. shows video signals (color bars) used in adjusting the video section.

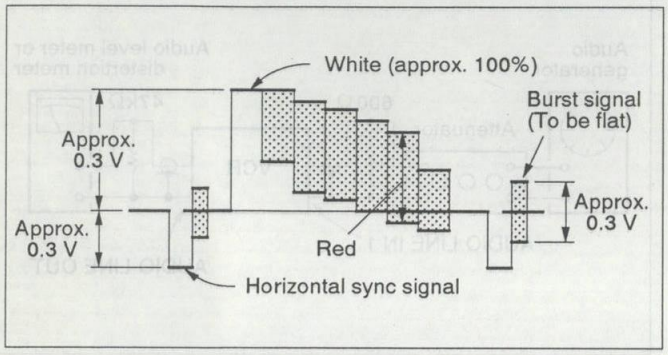


Fig. 7-2.

7-1-4. Alignment Tape (MH-2)

	Time	Video signal	Audio signal
1	10 minutes	Stair-step	6 kHz
2	5 minutes	—	3 kHz
3	10 minutes	Color bar	1 kHz
4	3 minutes	RF sweep	—

Table. 7-1.

7-1-5. Specified I/O Level and Impedance

Input/output terminal

Video inputs
LINE IN : phono jacks
EURO-AV : 21-pin (Pin ⑳) 1 Vp-p, 75 Ω , unbalanced, sync negative

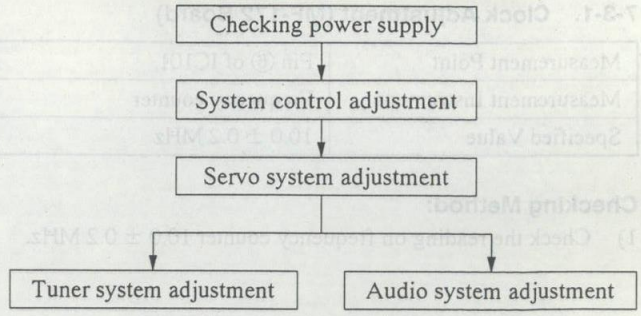
Audio inputs
LINE IN : phono jacks
47 kΩ , − 7.5 dBs (0 dBs = 0.775 Vrms)
EURO-AV : 21-Pin (Pin ② and ⑥)
More than 10 kΩ , − 4 dBs

Video outputs
LINE OUT : phono jack
EURO-AV : 21-pin (Pin ⑲) 1 Vp-p, 75 Ω , unbalanced, sync negative

Audio outputs
LINE OUT : phono jack
− 7.5 dBs at load
impedance 47 kΩ
Output impedance : less than 10 kΩ
EURO-AV : 21-Pin (Pin ① and ③)
Output impedance : less than 1 kΩ
−4 dBs with 10 kΩ load

7-1-6. Adjusting Sequence

Make the electrical adjustment in the following sequence.



7-2. POWER SUPPLY CHECK (POWER BLOCK)

Mode	E-E
Measuring Instrument	Digital voltmater
UNSW 6.0 V check	
Measurement Point	Pin ⑤ of CN2
Specified Value	5.9 ± 0.05 Vdc
UNSW − 30 V check	
Measurement Point	Pin ⑤ of CN2
Specified Value	− 27.0 ± 3.0 Vdc
UNSW 35 V check	
Measurement Point	Pin ⑨ of CN2
Specified Value	37.0 ± 3.0 Vdc
UNSW 12 V check	
Measurement Point	Pin ① of CN2
Specified Value	13.6 ± 0.4 Vdc
MTR 12 V check	
Measurement Point	Pin ⑩ of CN1
Specified Value	13.0 ± 0.4 Vdc
HEATER 4 V check	
Measurement Point	+ : Pin ② of CN1 − : Pin ① of CN1
Specified Value	4.1 ± 0.3 Vdc

Checking Method:

1) Confirm that each voltage meets its specified value.

POWER BLOCK (Conductor side)

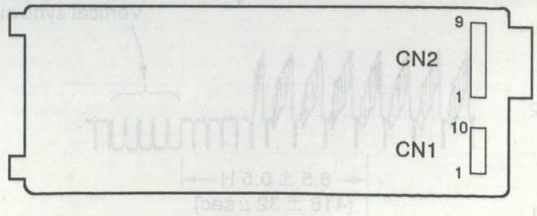


Fig. 7-3.

7-3. SYSTEM CONTROL CHECK

7-3-1. Clock Adjustment (MF-172 Board)

Measurement Point	Pin ⑥ of IC101
Measurement Instrument	Frequency counter
Specified Value	10.0 ± 0.2 MHz

Checking Method:

1) Check the reading on frequency counter 10.0 ± 0.2 MHz.

7-4. SERVO SYSTEM ADJUSTMENT

7-4-1. Switching Position Adjustment (MA-144 Board)

Mode	PB
Signal	Alignment tape : SP stair-step section
Measurement Point	CH1: CNJ701 (VIDEO LINE OUT) CH2: Pin ⑲ of CN601 (RF SWP)
Measuring Instrument	Oscilloscope
Adjusting Element	RV202
Specified Value	6.5 ± 0.5 H (416 ± 32 μsec)

Adjusting Method:

1) Once set to STOP mode, then to PB mode.
2) Check that switching position is 6.5 ± 0.5 H. (416 ± 32 μsec)
   If not meet the specified value, turn RV202 and repeat steps 1) to 2).

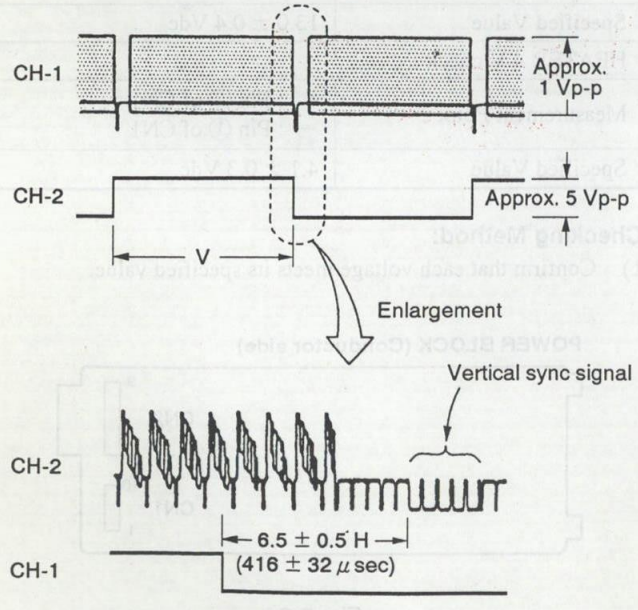


Fig. 7-4.

7-5. AUDIO SYSTEM ADJUSTMENTS

- Adjust the audio system in the SP mode, unless otherwise specified.
  Use the alignment tape.
- Adjust both Lch and Rch.

[Connection]

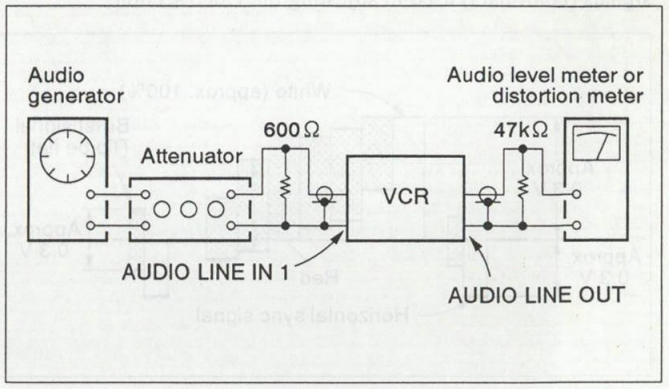


Fig. 7-5.

7-5-1. Normal Audio System Adjustment

- Make adjustment in the SP mode, unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Make adjustment with the switches set to the following positions.
  INPUT SELECT switch ..... LINE 1

[Adjusting Sequence]

1. ACE head adjustment ... See Mechanism Block Adjustment
2. E-E output level check
3. Recording bias adjustment
4. Overall level characteristic and distorsion check

1. ACE Head Adjustment

See "Mechanism Block Adjustment".

2. E-E Output Level Check

Mode	E-E
Signal	L, R : 400 Hz, − 7.5 dBs
Measurement Point	AUDIO LINE OUT L or R
Adjusting Element	Audio level meter
Specified Value	− 7.5 ± 2 dBs

Confirming Method:

1) Simultaneously input a signal of 400 Hz, − 7.5 dBs to both L and R channels of Audio Line Input.
2) Confirm that the audio output level is − 7.5 ± 2 dBs.

3. Recording Bias Adjustment (MA-144 Board)

Mode	REC and PB
Signal	400 Hz, − 30 dBs 7 kHz, − 30 dBs
Measurement Point	AUDIO LINE OUT L or R
Measuring Instrument	Audio level meter
Adjusting Element	RV851
Specified Value	0 ± 1 dB

Adjusting Method:

1) Supply a signal of 400 Hz, − 30 dBs to Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate − 30 dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7 kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
7) Confirm that the 7 kHz playback output levels within a range of the 400 Hz playback output level 0 ± 1 dB. When beyond this range, sdjust RV851 and repeat the steps 1) through 7) above.

4. Overall Level Characteristic and Distortion Factor Check

Mode	REC and PB
Signal	400 Hz, − 7.5 dBs
Measurement Point	AUDIO LINE OUT L or R
Measuring Instrument	Audio level meter and distortion factor gauge
Specified Value	Playback level : − 7.5 ± 2 dBs Distortion factor : 4% or less

Confirming Method:

1) Supply an audio signal of 400 Hz, − 7.5 dBs simultaneously to both L and R channels of Audio Line Input.
2) Make recording.
3) Playback a recorded portion.
4) Confirm that a playback level is − 7.5 ± 2 dBs.
5) Confirm that a distortion factor is within 4%.

7-6. TUNER SYSTEM ADJUSTMENT

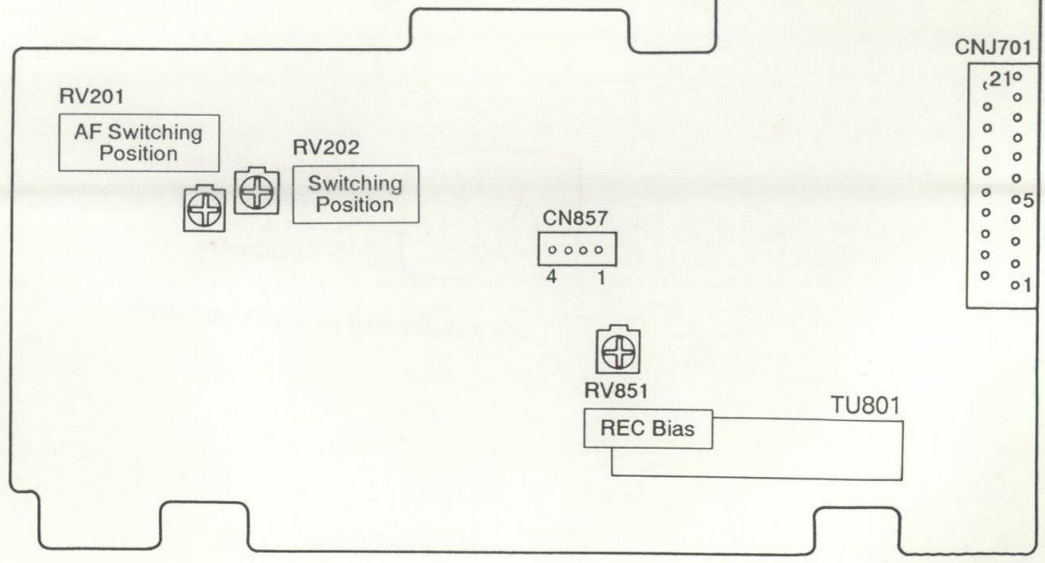
Signal	SLV-E5AE/AP/B/CP/IT RF : E-5 CH, 66 ± 5dB μV SLV-E5VP RF : E-5 CH, 63 ± 5dB μV SLV-E6UV RF : B-30 CH, 66 ± 5dB μV (Video: Color Bar / Audio: Optional)
Mesurement Point	TU801 Pin ④
Measuring Instrument	Digital voltmeter
Specified Value	6.0 ± 0.5 V

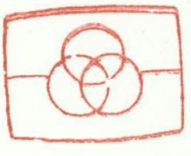
Cheking Method:

1) Tune in the casnnel above in the table.
2) Connect a digital voltmeter to TU801 Pin ④ and confirm the reading on a digital voltmeter gose 6.0 ± 0.5 V.

7-7. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

MA-144 BOARD (COMPONENT SIDE)





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SONY

SERVICE MANUAL

AEP Model
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Netherlands Model
SLV-E5AP

French Model
SLV-E5B

Spanish Model
SLV-E5CP

Irish Model
SLV-E5EI

Itarian Model
SLV-E5IT

German Model
SLV-E5VP

UK Model
SLV-E6UV

CORRECTION-1

Please corrected your service manual.
(96-012)

☛ : Indicates corrected portion.

Page	INCORRECT				CORRECT			
	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
114	1	X-3942-978-1	DOOR BLOCK ASSY (M), HALF (UV)		1	X-3942-973-1 ☛	DOOR BLOCK ASSY (M), HALF (UV)	

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